UNIVERSITY OF MICHIGAN
JUL 24 1952
DENTISTRY LIBRARY

THE AMERICAN ACADEMY OF DENTAL MEDICINE
FOUNDED 1945
COOPERATION KNOWLEDGE UNDERSTANDING

Journal of DENTAL MEDICINE

JULY, 1952

IN THIS ISSUE

What Has Been Contributed to Dentistry by the Radioactive Isotopes? Jean-Paul Lussier 65

Preventing Tooth Decay in Children Louis B. Kelsten 74

The Dentist's Role in the Detection and Prevention of Systemic Disease Isador Hirschfeld 78

Addresses by Deans D. P. Mowry and Ernest Charron 80

Academy Proceedings 85

American Academy of Dental Medicine Annual Awards 90

Book Reviews 96

Medical Views on Oral Problems 98

Announcements 101

Vol. 7 • No. 3

OBJECTIVES OF THE AMERICAN ACADEMY OF DENTAL MEDICINE

(*Quoted from the Constitution*)

"To promote the study and dissemination of knowledge of the cause, prevention and control of diseases of the teeth, their supporting structures and adnexa and related subjects; and to foster and promote a better scientific understanding between the fields of dentistry and medicine."

THE JOURNAL OF DENTAL MEDICINE

Published by

The American Academy of Dental Medicine

Volume 7 July 1952 Number 3

Publications Committee

Allan N. Arvins, D.D.S., *Chairman*

Morton S. Biskind, M.D.
J. Lewis Blass, Ph.G., D.D.S.
Louis R. Burman, Ph.G., B.S., A.M., D.D.S.
Julius N. Obin, B.A., D.D.S.
Hayes Martin, M.D.
Samuel Charles Miller, D.D.S.
Harry Roth, B.S., D.D.S.
Sidney Sorrin, D.D.S.

Published quarterly at New York, N. Y.

Editor—Allan N. Arvins, 4 East 41st St., New York 17, N. Y.

Associate Editors

J. Lewis Blass
S. Leonard Rosenthal

Assistant Editors

Arthur N. Yohai
Melvin A. Snyder
George Witkin
Irving Yudkoff
Nathan Wachtel

Business Manager—Harold E. Brennan, 527 Fifth Ave., New York, N. Y.

Subscription $3.00 Yearly

Single copies, $1.00

Publication in the Journal of Dental Medicine is not an endorsement by the American Academy of Dental Medicine of opinions in any article, abstract or extract. The Editor and Publisher are not responsible for opinions expressed by authors of contributions.

Copyright 1952 by the American Academy of Dental Medicine, Inc.

DIRECTORY OF OFFICERS

President — Harold R. Gelhaar
President-Elect — Alvin H. Berman
Secretary — William M. Greenhut
Treasurer — George G. Stewart
Editor — Allan N. Arvins

BOARD OF TRUSTEES

Alvin H. Berman, Chairman

Abramson, Irving
Arvins, Allan N.
Burman, Louis R.
Bruns, George A.
Blass, J. Lewis
DeScherer, Morton
Dobbs, Edward C.
Goldstein, Abraham
Miller, Samuel Charles
Rosenthal, S. Leonard
Scott, Leon W.
Sorrin, Sidney
Witkin, George

CHAIRMEN OF COMMITTEES

Publication — Allan N. Arvins
Membership — Abraham Goldstein
Fellowship — Alvin H. Berman
Dento-Medical — George F. Clarke
Historian — William M. Greenhut
Academy Representative — George Witkin
Aid to Dental Students — S. Leonard Rosenthal
Research — Edward C. Dobbs
December Meeting — Jacob A. Englander, Samuel Turkenkopf
Planning — J. Lewis Blass
Sections — Samuel Charles Miller
Annual Meeting — Walter I. Levine

WHAT HAS BEEN CONTRIBUTED TO DENTISTRY BY THE RADIOACTIVE ISOTOPES?*

JEAN-PAUL LUSSIER, D.D.S., M.Sc., *Montreal, Quebec*

INTRODUCTION

The era of atomic energy begins for the layman with the event of the atomic bomb. But atomic energy is linked with radioactivity and this concept arose more than fifty years ago from the Curies' discovery. We must visualize atomic energy and radioactivity in the relation of cause and effect. We know that there are many applications for radium in medicine as well as in industry but so far, we can not say the same for atomic energy. From the standpoint of the biologist, the interest in radioactivity was born in 1935, when Hevesy reported a preliminary experiment which opened the field of radiobiology. It was noted that the injection of a radioactive isotope of phosphorus into a living animal indicates how this element is distributed throughout the body, how long it takes to penetrate the different tissues, and how long it stays in them. Moreover, as anticipated, the living tissues can not discriminate between the natural isotope and the radioactive one. A year before, Hevesy and Hoper (1934) introduced the use of heavy stable isotopes in biological research as they studied the partition of *heavy water* in the living fish and human, but the use of radioactive isotope so simplified the techniques that it was considered an unexpected improvement over the previous method. After this very stimulating finding, the radioisotopes were applied to many problems.

GENERALITIES

We would like to briefly glance at the historical background of radioactivity, and abstract the landmarks of the last half century of its discovery and applications.

DISCOVERY OF RADIOACTIVITY

A year after the discovery of X-Rays by Roentgen in 1895, Becquerel tried to find the relationship between the fluorescence of uranium salts and those mysterious rays. He noticed that photographic plates could be strongly affected by the contact or presence of these salts even if the fluorescence had not been previously induced by sunlight. Two young students, Pierre Curie and Marie Sklodowska, who had just enrolled to compete for doctorship degrees under his direction, were urged by Becquerel to study this fascinating problem. Two years later, polonium and radium had been identified. During the ensuing years, many laboratories in Europe reported identification of further radioactive elements, such as actinium, radiolead, radiothorium, etc.

The chemical phenomena were soon shaded by the physics research. Indeed, astonishing data were rapidly accumulating in the hands of the physicists, who were interested in the mysterious rays that were emanating from the elements, and not the elements themselves. Sir Ernest Rutherford, then working in this city as Professor of Physics at the McGill University, succeeded in distinguishing different emanations which constituted the highly complex phenomenon of radioactivity. These radiations were of three different types *alpha, beta* and *gamma* and some of their characteristics are summarized in table 1.

It will be emphasized later in this paper that these characteristics are very helpful in selecting the right type of isotope for use as a tracer or as a radiation carrier.

* Presented at the Sixth Annual Meeting of the American Academy of Dental Medicine, Montreal, May 30th 1952.

† Assistant Professor of Physiology, Faculty of Medicine, Université de Montréal.

TABLE I

Rays	*Nature*	*Penetrating Power limit*	*Sign of charge in magnetic field*	*Velocity*
	Helium nuclei	0.1 mm (Al.)	+	20 000 Km/sec.
	Electrons	5 mm (Al.) or 1 mm (Pb.)	+ —	100 000 Km/sec.
	Similar to X-Rays	20 mm (Pb.)	0	300 000 Km/sec.

ARTIFICIAL RADIOACTIVITY AND TRANSMUTATION

These pertain to naturally radioactive elements. We now have elements which are artificially rendered radioactive. It was known since 1934 not only that radioactivity can be artificially induced in a stable isotope of an element, but that the same reaction can transform the target element into another one, and this phenomenon is called transmutation. The first transmutation happened when Irene Curie and her husband, Frédéric Joliot, made radioactive nitrogen out of boron by bombarding it with *alpha* rays. Several authors have reported the production of many other artificially radioactive elements with the cyclotron of Lawrence and the electrostatic generator of Van de Graaff. These atom-smashing apparatus were designed to transmutate elements. Thus two kinds of radioactive material, natural and artificial, are known and from this combination the production of the atomic bomb was made possible. But an indispensable tool had to be wrought to cast the atomic bomb: the atomic pile. This can be considered as a huge source of neutrons escaping from pure uranium 235. These neutrons captured by uranium 238 give birth to plutonium 239, the noble element of the atomic pile.

PILE PRODUCED ISOTOPES

However, the neutrons produced from uranium 235 are not entirely used by uranium 238, and some additional material may be used as a target for some of the remaining neutrons. Thus we may have elements transmutated in the atomic pile by the action of neutrons in the following way:

$$P^{31} + n \rightarrow P^{32} + y$$
(artificial radioactivity)

$$N^{14} + n \rightarrow C^{14} + p$$
(transmutation)

The radioactive isotopes are now available for research purposes in Canada from the N.R.C.A.E. Project at Chalk River or from the A.E.C.U.S. at Oak Ridge.

CHARACTERISTICS OF RADIOACTIVE ISOTOPES

The choice of a radioactive element for research purposes is conditioned by three main factors, 1) the isotope and its chemical properties, 2) radiation characteristics and 3) half-life which is the period necessary for a given radioelement to lose half of its radioactive units. If, for example, we wish to study the metabolism of chlorine, we have a choice of four radioactive isotopes of chlorine (table II). For a short duration experiment Cl^{34} and Cl^{38} may be used advantageously as their energy is fairly high. For a long duration experiment Cl^{36} should be used, unless the organism studied reacts towards bromine as well as towards chlorine. Then Br^{83} could replace the Cl^{36}.

RADIATION CHARACTERISTICS

Radiation characteristics vary with the type of particles emanated, as already

TABLE II

Isotope	*T* 1/2	*Type of Radiation*	*Max. Energy (MEV)*
Cl^{33}	2.4 sec.	β^+	4.13
Cl^{34}	33 min.	$\beta\gamma^+$	2.5
Cl^{36}	1 x 10^6 y	$\beta^+ \beta^-$	0.64
Cl^{38}	37 min.	β^+	4.4

pointed out. For biological purposes a pure *beta* emitter element makes an ideal tracer provided the energy of the *beta* particles is high enough. If it is too low, the large dilution of the tracer during the experiment as occurs when an animal is injected with a small amount of a radioelement, will render its detection very hard and consequently less accurate. That is why P^{32} having a maximum energy of 1.5 MEV is preferable to Ca^{45} of 0.3 MEV.

HALF-LIFE

The half-life is another characteristic of prime importance. By measuring the rate of decay over a certain period of time, it can be shown where the half-life is accurately located as in graph I. The longer the half-life the more suitable the element as a tracer unit. As a rule, a radiosotope is suitable for an experiment when the duration does not exceed four times its half-life.

RADIOACTIVITY UNIT

In terms of radioactivity, the millicurie is the unit commonly used. If we say that a radioactive sample has a radioactivity of one millicurie, it means that 3.7 x 10^7 disintegrations occur per second; *i.e.* that such a number of particles *alpha, beta* or *gamma* escapes from disintegrating atoms. When we work with

Graph I

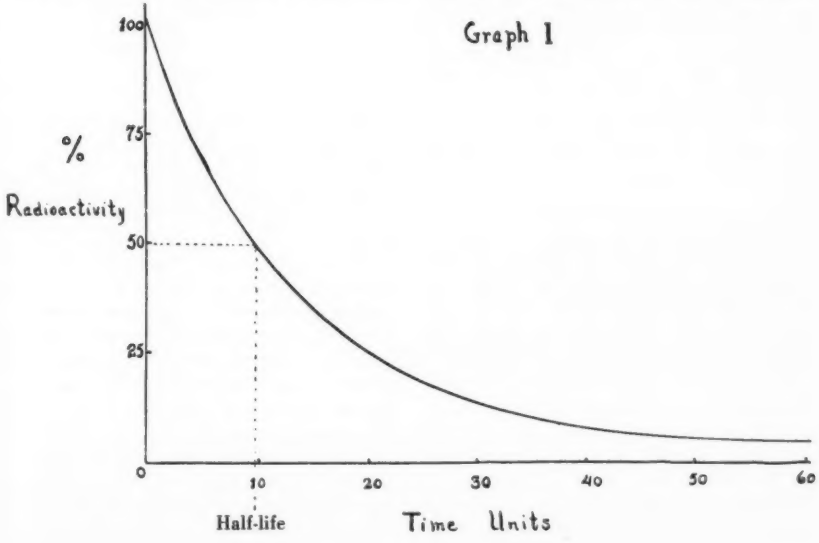

TABLE III

Symbols and Mass No.	*Half-life (Seaborg and Perlman, 1948)*	*Particles emitted*	*Energy (MEV)*
C^{14}	5700 y	β^-	0.155
F^{18}	112 min.	β^+	0.60-0.95
Na^{24}	14.8 h	$\beta^-(\gamma)$	1.39
P^{32}	14.3 d	β^-	1.71
Cl^{36}	4.4×10^5 y	β^-	0.73
K^{40}	4.5×10^8 y	β^-	1.3
Ca^{45}	152 d	β^-	0.260
Ga^{72}	14.1 d	$\beta^-(\gamma)$	0.56-3.17
Sr^{89}	53 d	β^-	1.50
I^{131}	8.0 d	$\beta^-(\gamma)$	0.605
Au^{198}	2.7 d	$\beta^-(\gamma)$	0.96
Ra^{236}	1590 y	$\beta^-(\gamma)$	4.79
U^{233}	1.63×10^5 y		4.82
Pu^{239}	2.4×10^4 y		5.14
Am^{241}	500 y		—

specimens containing a low radioactivity, we give results in terms of counts per minute (cpm).

MEASURING APPARATUS

The most suitable apparatus to evaluate the radioactivity in biological samples is the Geiger-Muller tube connected with a scaler unit. It makes a sensitive and accurate instrument easy to calibrate and use. The GM-tube principle is simple and with minor modifications has several applications.

RADIOAUTOGRAPHS

The contact of a radioactive surface with a photographic emulsion gives a definite picture as shown by Becquerel. Applying the same principle, we can survey a radioactive specimen by placing an X-Ray film in close contact with it.

Heller (1951) and Fitzgerald (1951) recently reviewed the different techniques on this topic. Gross radioautographs enable us to rapidly localize areas affected by the radioactive tracer. More delicate methods as Bélanger's (1946) or Evans' (1947) permit microscopical examinations. Wainwright (1949) could evaluate the radioactivity in critical spots, by means of nuclear track emulsions into which alpha emitters enter and attack the silver grains.

DENTAL DATA

Now that we are well acquainted with the radioactive personalities of the stage, which role are they going to play in the research performances? Considering that few dental applications are foreseen for them as radiation units, we shall treat them mostly as tracer units. Table III shows the list of isotopes used in dental research.

If we review the literature, we first meet Chievitz and Hevesy (1937) who demonstrated with cyclotron-produced P^{32} the phosphorus distribution in the body with special reference to the dental tissues. These tissues received special attention because of their peculiar affinity for phosphates as part of their structure and for the variety they offer all through their differently calcified layers. If someone finds that Hevesy seems to appear too often on the stage, it is because as Rit-

tenberg stated "he was not only one of the fathers of the isotopic technique, but also the attending gynecologist."

CONFIRMATIVE WORKS

Before going any further, it may be of a certain interest to recall that several experiments made with isotopes had the sole merit of confirming previous findings using other techniques. But if in these experiments, "originality" is missing, they may still have some value for better controlled works and for obtaining more precise data. For instance, studying the permeability of dental structures, Bevelander and Amler (1944, 1945) found *in vivo* and *in vitro* that the P^{32} penetration is inversely related to the degree of calcification and stated the following order in the dentin: coronal < apical < secondary < circumpulpal. Bodecker (1943) confirmed the existence of a dental lymph which he had previously demonstrated (Bodecker 1929). Much is known about the calcification of the bones of the skull and face: it is well understood that they do not calcify equally and simultaneously, but Jarabak and Kamins (1951) did not hesitate in reinvestigating this question with calcium 45.

The outstanding works of Berggren (1947, 1952) on the permeability of dentin and enamel to dyes and bacterial toxins, received substantial help from radioisotopes. The translucent zone of reaction in the dentin is evaluated by many authors as representing a defensive reaction of the pulp to invading caries or severe attrition which renders it very hard and almost impervious as enamel itself. It was shown that this zone was penetrated by neutral red. Methylene blue does not enter this zone though it stains sound dentin well. By the aid of radiophosphorus, Leung (1947) does not find any substantial differences between sclerosed and normal dentin and according to Berggren (1952) it appears that this translucent zone is quite permeable, thus readjusting to its normal size, a phenomenon that was over-emphasized.

Speaking of dyes, we know that alizarin has been a highly recommended dye for the vital staining of bone, as it forms a stable compound with calcium. However, Jarabak (1951) soon recognized that radiocalcium is by far more detectable, and more rapidly attracted by the tissue. Many areas free of alizarin are highly enriched with calcium thus demonstrating the great sensitivity of the technique.

These examples indicate how short, simple and accurate an experiment can be when radioisotopes are used instead of dyes or other chemically detected compounds. We do not wonder now that many previous experimental or clinical results that need certain degrees of control are tested for reproducibility with this astonishing technique.

PERMEABILITY OF DENTAL STRUCTURES

One of the main benefits dentistry has received from the isotopic technique is the estimation of the different degrees of permeability of the dental tissues. Two questions present themselves at this point. First, are the changes that take place in dental tissues due to biological factors or only to physico-chemical influences? In other words, can the dental structures react intrinsically (inherently) or are they simply the site of action of extrinsic factors? Second, are these reactions checked or altered by the death of the tissue, *i.e.* are *in vitro* or *in vivo* findings entirely interchangeable?

REJUVENATION

Hevesy *et al.* (1937, 1940, 1948) answer partially to the first question. Some changes are continuously taking place in enamel as well as in dentin. After injecting animals with P^{32}, he finds that in the rat after two days the isotope is distributed in the different parts of the tooth in the following order:

incisor apex	0.4%
incisor root	0.1%
incisor tip	0.01%

In the erupted molar the uptake is considerably less. In order to appreciate

the rate of renewal or "rejuvenation" in the calcified tissues of the rabbit, several doses of P^{32} were injected at regular intervals; after 50 days, the radioactivity was determined in the incisor (which in the rabbit is a continuously growing tooth). The ratios of radioactivity in the dental portions to that of the circulating blood are as follows:

incisor dentin	apex	1.03
incisor dentin	middle	0.98
incisor dentin	tip	0.41
incisor enamel	apex and middle	0.83
incisor enamel	tip	0.06

Therefore the growing tooth is taking up blood minerals avidly, rapidly in its calcifying layers. But the uptake is inversely related to the degree of calcification. If we apply the concept of rejuvenation to the calcifying structures, they are rejuvenated rapidly, but the more calcified a structure, the less rejuvenated, and the closer the cellular layers; the larger the uptake of phosphorus or calcium. Hevesy thus assumes that in a fully erupted human tooth about one percent is rejuvenated in 250 days. Moreover, Pedersen and Schmidt-Nielsen's (1941) experiment on human beings, showed that the turnover is slow and restricted to the dentin. The radioactivity in enamel is mostly derived from the saliva as shown by those authors, and this is definitely corroborated by Sognnaes and Shaw (1952).

Answering the first question then, it can be said that the dental tissues, with the exception of enamel, might be considered as living tissues because their rate of renewal is comparable to the living bone to a certain degree. Cementum and dentin during their growth show a high level of vitality, but when they reach maturity their metabolism slackens considerably. Enamel, though it is the site of certain changes, does not seem to be a living tissue and to give reactions of its own. Its metabolism is so low as to be questionable. However, Sognnaes and Shaw (1952) have published data which might enable us to settle the second question and demonstrate that even if dental enamel is not a living tissue it behaves differently *in vivo* than *in vitro*.

It is known since Pedersen and Schmidt-Nielsen (1942) that the uptake of radiophosphorus by the enamel occurs in the external layers by means of saliva which acts as a carrier of radiophosphate. The continuous contact of enamel with saliva permits, through the law of equilibrium between a saturated solution and a precipitate, the exchange of ions from one phase to the other. Sognnaes and Volker (1941) have determined this and Sognnaes's latest report ascertain that enamel P^{32} is mostly derived from saliva but the same tooth in the same conditions outside the body absorbs 3 to 9 times less P^{32} as *in vivo*.

LEVELS OF PERMEABILITY

As you see, some new phenomena may be suspected to occur in the hardest structures of the teeth. This has been lately indicated by Wainwright and coworkers (1950, 1951). They demonstrated that radioactive urea can diffuse rapidly through dental enamel which might be, by our criteria, estimated as very normal. Even if urea fills more intensively less calcified areas, *i.e.* where lamellae and cracks are more numerous, exogenously the penetration is a continuous one. The dentin itself is entirely invaded if urea is diffusing via the pulp. According to Wainwright (1951) three levels of permeability can be distinguished:

1. — a low level, shown by the thin film left by plutonium salts when they are in contact with dental enamel. They are strongly held at the surface and no further penetration occurs. However, the same enamel may be penetrated by silver nitrate even after penetration of the plutonium salts.

2. — a medium level, due to enamel defects. The more numerous the cracks the greater the uptake of radioactive tracers. This is observed when radioactive copper, silver and palladium salts were used.

3. — a high level, determined by highly diffusible material such as urea. In this case, the uptake with no discrimination for the anatomic conditions, was obvious at every layer of the dental enamel. Some other C^{14} containing organic compounds such as thiourea, acetamide and nicotinamide were tried successfully. Although not as diffusible as urea, they were identified in sound enamel.

Bartelstone (1951) clearly established that I^{131} diffusing through dental enamel finds its way to the pulp and can be identified in the thyroid gland where iodine is concentrated. This centripetal penetration shows that the organic framework of enamel can become a natural pathway to many compounds.

These facts favor a widening of our concepts about the physical characteristics of dental enamel. It seemed to us as a rigid frontier that strongly protects dentin and pulp from external influences. Lamellae and cracks also seemed to be the only weaknesses which could become a portal of entry to noxious substances. However, not only lamellae, but also the organic framework as well as the minute amount of water which is a component of dental enamel might be the means of penetration.

MECHANISMS OF EXCHANGE

The microcrystallites which constitute the calcified phase of bone, dentin and enamel have long been investigated. Summarizing the works that have established the existence of an exchange phenomenon between the calcified tissues and the circulating fluids, Hodge (1951) gave the following statement: "Because the mechanisms by which the mineral metabolic processes are carried on are even more difficult to elucidate using ordinary chemical methods, the contributions that have been made by the use of radioisotopes to our knowledge of the pathways and mechanisms of mineral transfers probably represent the most important use of isotopes in the study of the teeth."

We shall strongly agree that with the aid of radioisotopes, a dynamic equilibrium has been shown between crystallized salts of enamel and dentin and the same salts dissolved in blood, lymph or saliva, at the point of contact between the two phases. Exchange phenomena continuously take place. The rate of exchange is conditioned by certain factors as the structure and the size of the crystals, and is estimated to be 12 percent in bone, one percent in dentin and about 0.2 percent in enamel.

The advantages of the benefits from Knutson's technique (1948) can be explained by these studies. Fluorine is exchanged at the enamel surface with phosphate and the final reaction is the formation of calcium fluoride, which is the least soluble calcium salt in acid media. Moreover, Newman (1950) gave an acceptable explanation of the influence of fluorine in drinking water as a protective measure against dental caries, at these low concentrations in the blood or saliva, fluorine can be incorporated in the space lattice of apatite and contribute to form fluoroapatite instead of hydroxylapatite which ordinarily occurs in enamel crystals. As fluoroapatite is less acid soluble than hydroxylapatite, it happens that the more fluoroapatite in enamel, the more resistant the tooth to decay. The experiment of Martin and Slater (1951) may also support this interpretation. Underwood and Hodge (1952) recently established that the rate of exchange in enamel was greater for calcium than phosphorus. This is the indication that the exchange mechanism in enamel may be influenced by factors other than those present in bone or dentin.

INFLUENCE OF SOME PHYSIOLOGICAL AND PATHOLOGICAL FACTORS

Up to now the discussion involved observations on sound teeth. Many studies were undertaken in order to evaluate the importance of different influences in the permeability or other characteristics of the teeth. The main features may thus be summarized. Blayney *et al.* (1941) and Wassermann *et al.* (1941) found that decayed teeth are more permeable

than normal controls. On the contrary, pulpless teeth and teeth in sockets where the periodontal membrane is diseased show a considerable decrease of permeability. Reinvestigating this problem, Sognnaes and Shaw (1952) confirm that permeability to salivary phosphorus decreases with age and that dentin is nine times less permeable when the tooth is pulpless. However, its linkage to the periodontal membrane and the dentinoenamel junction were shown to be sites of exchange. It can be inferred that the removal of pulp very intensively modifies the rate and quantity of the circulating fluids in the different parts of the tooth up to the point that external influences do not affect it at the same degree. This might be interpreted as another argument in favor of the living state of the tooth structures.

PRACTICAL APPLICATIONS

Besides the topics of academic interest at which we have glanced, the radioisotopes may be directed to numerous applications originating from daily routine. Many drugs have been advocated in operative techniques in order to render dentin less absorbent to filling materials. Amler and Bevelander (1951) have tested the effectiveness of several medicaments in their ability to limit the permeability of dentin. Cavities were prepared, coated by the drug to be tested and filled. At different periods the fillings were taken out and the cavity wetted with a cotton pellet containing radioactive solution and a new amalgam filling was made to cover it.

Results indicated that not only phenol, silver nitrate-eugenol and cavity varnish failed to harden or protect dentin but they rather increase its permeability. Sodium fluoride 2 percent reduces P^{32} penetration while alcohol 70 percent is without any effect.

The work of Armstrong and Simon (1951) permits us to appreciate what is the adaptation of a filling material to the cavity margins. Cavities were prepared, wetted with a Ca^{45} containing solution, dried and filled with one of the filling materials. Acrylic resins seem to be far superior in this respect especially if the mixing technique is well followed. Amalgam comes next. Gold foil and cemented inlay are far from being leakproof at the margins. Zinc oxyphosphate cement is penetrated by the radioactive solution although not as much as silicate. Glass and Zander (1949) had already shown that the permeability of dentin to silicate fillings is quite high and that pulp irritation may be induced through this channel.

This short review of the latest facts concerning the application of the radioactive technique to the dental science would be incomplete without mentioning Burstone's (1951) experiment. High radioactivity has a chronic influence on the development of teeth and jaws as shown in the mouse. Severe changes were observed as osteodentin formation in the pulp chamber and fibrosis of the alveolar bone. The oral epithelium and the salivary glands were also affected. There is a hemiatrophy of the face on the injected side, and an occlusal imbalance follows.

With D'Iorio (1951), we have shown the daily uptake of the calcified structures in the growing rat. Actually we are determining the influence of a long protein fast in the calcium turnover in different tissues (1952) and especially the tooth.

CONCLUSIONS

Such a bird's eye view on the panorama of the works performed in dentistry and dental biology with the radioactive tools enables us to foresee beyond future horizons. With the availability of radioactive materials and the continuously growing team of skillful operators, there is no doubt that the popularity of this technique will be increasing, and that more interesting facts will be accumulated about physiologic, pathologic, pharmacologic and chemical factors in relation to dentistry. Biologic mechanisms that occur in the dental tissues are actually challenging many research workers. The valuable information they have

brought us are very stimulating and everything leads us to believe that this trend is going to be pursued until the right answer is found.

BIBLIOGRAPHY

1. Amler, M. H. and Bevelander, G. (1951) Dentin permeability of radioactive phosphorus after specific time intervals following the applications of various drugs. N. Y. J. Dent. 21:295.

2. Armstrong, W. D. and Simon, W. J. (1951) Penetration of radiocalcium at the margins of filling materials: a preliminary report. J.A.D.A. 43:684.

3. Bartelstone, H. J. (1951) Radioiodine penetration through intact enamel with uptake by bloodstream and thyroid gland. J. Dent. Res. 30:728.

4. Bélanger, L. F. and Leblond, C. P. (1946) A method for locating radioactive elements in tissues by covering histological sections with a photographic emulsion. Endocrinology 39:8.

5. Berggren, H. (1947) Experimental studies on the permeability of enamel and dentine by means of radioactive isotopes, bacteria, bacterial toxins and dyes. Svensk Tandläretidskrift 40:#1B.

6. Beggren, H. and Hedtström H. (1951) Experimental studies in vivo on the permeability of enamel with particular regard to the effect of sugar solutions. J. Dent. Res. 30:161.

7. Berggren, H., and Cederberg, J. (1952) The translucent zone of reaction in the dentin, A. radioautographic study. Ark. fur Fysik 41:565.

8. Bevelander, G. and Amler, M. (1944) Uptake of P^{32} in vitro by tooth. J. Dent. Res. 23:151.

9. Bevelander, G. and Amler, M. (1945) Radioactive phosphate absorption by dentin and enamel. J. Dent. Res. 28:45.

10. Bodecker, C. F. (1943) Tooth condition: A factor in experimental isotope absorption. J. Dent. Res. 22:281.

11. Bodecker, C. F. (1929) A new theory of the cause of dental caries. Dental Cosmos 71:586.

12. Blayney, J. R., Wassermann, F., Groetzinger, G. and de Witt, T. G. (1941) Further studies in mineral metabolism of human teeth by the use of radioactive phosphorus. J. Dent. Res. 20:559.

13. Burstone, M. S. (1951) Studies on the alterations of development of the teeth and adjacent structures following local administration of chronic phosphate containing P^{32}. J.A.D.A. 42:418.

14. Chievitz, O. and Hevesy, G. (1935) Radioactive indicators in the study of phosphorus metabolism in rats. Nature 136:754.

15. Chievitz, O. and Hevesy, G. (1937) The metabolism of phosphorus in animals. Kgl. Denske Vidensk Selsk. Biol. medd. 13:24.

16. D'Iorio, A. and Lussier, J. P. (1952) Uptake of radioactive calcium by the dental tissues of the young rat. Rev. Can. Biol. 10:175.

17. D'Iorio, A. and Lussier, J. P. Calcium metabolism in blood and mineralized tissues at different dietary protein levels as indicated by Ca^{45} (in preparation).

18. Evans, T. C. (1948) Selection of radioautographic technique for problems in biology. Nucleonics 2:52.

19. Fitzgerald, P. J. (1952) Radioautography in cancer. Cancer 5:165.

20. Glass, R. I. and Zander, H. A. (1949) The penetration of labeled phosphate from silicate into dentin. J. Dent. Res. 28:657.

21. Heller, D. A. (1951) The radioautographic technique. Adv. In Biol. and Med. Phys. Acad. Press Inc., N. Y.

22. Hevesy, G. (1948) Radioactive indicators Interscience Pub. N. Y.

23. Hevesy, G. and Hoper, E. (1934) Diplogen and fish. Nature 133:495.

24. Hevesy, G., Levi, H. B. and Rebbe, O. H. (1940) Rate of rejuvenation of the skeleton. Biochem, J. 34:532.

25. Hodge, H. C. (1951) The pathways of mineral metabolism in the tooth tissues as shown by radioisotopes. N.Y.J.D., 21:288.

26. Jarabak, J. R. (1951) Radiocalcium uptake as compared with alizarin in the mineralization of bone. J. Dent. Res. 30:511.

27. Jarabak, J. R., and Kamins, M. (1951) The uptake of radiocalcium (Ca^{45}) in the skull and face of the rat. J. Dent. Res. 30:511.

28. Knutson, J. W. (1948) Sodium fluoride solutions: Technic for application to the teeth. J.A.D.A. 36:37.

29. Leung, W. and Gilda, J. E. (1947) Phosphate transfer in sclerosed dentin studied by means of radioactive phosphorus. J. Dent Res. 26:40.

30. Martin, N. D. and Slater, E. S. (1951) Direct tissue radioautography technique applied to teeth. Science 113:721.

31. Newman, W. F., Newman, M. W., Main, E. R., O'Leary, J., Smith, F. A. (1950) The surface chemistry of bone: 2—Fluoride deposition. J. Biol. Chem. 187:655.

32. Pedersen, P. O. and Schmidt Nielsen, B. (1941) Experimentelle Undersogelser over fosforstofkifte i menneskelige taender med anvendelse af radioaktivt fosfor som indikator. Tandlegeblabet 45:396.

33. Pedersen, P. O. and Schmidt Nielsen, B. (1942) Exchange of phosphorus in human teeth Acta Odontol. Scand. 4:k.

34. Seaborg, G. T. and Perlman, I. (1948) Table of itosopes Rev. Mod. Phys. 20:585.

35. Sognnaes, R. F. and Volker, J. F. (1941) Exchange of P^{32} in the various parts of the enamel. J. Am. Coll. Dent. 8:57.

36. Sognnaes, R. F. and Shaw, J. H. (1952) Salivary and pulpal contributions to the radiophosphorus uptake in enamel and dentin. J.A.D.A. 44:489.

37. Underwood, E. E. and Hodge, H. C. (1952) Calcium exchange in enamel and dentin as shown by Calcium 45. J. Dent. Res. 31:64.

38. Wainwright, W. W. (1949) Detail and Survey radioautographs. Science 109:585.

39. Wainwright, W. W. (1951a) Three levels of enamel permeability. N.Y. J. Dentistry 21:308.

40. Wainwright, W. W. (1951b) Enamel penetration by radioactive salts of zinc, calcium, silver, plutonium palladium and copper. J.A.D.A. 43:664.

41. Wainwright, W. W. and Lemoine, F. A. (1950) Rapid diffuse penetration of intact enamel and dentin by carbon 14 labeled urea. J.A.D.A. 41:135.

42. Wainwright, W. W. and Belgrod, H. H. (1951) Time studies of the penetration of extracted human teeth by radioactive nicotinamide urea, thiourea and acetamide. II Penetration of dentin from the pulp chamber. J. Dent. Res. (abst.) 30:480.

43. Wassermann, F., Blayney, J. R., Groetzinger, D. and De Witt, T. Y. (1941) Studies on the different pathways of exchange of minerals in teeth with the aid of radioactive phosphorus. J. Dent. Res. 20:389.

PREVENTING TOOTH DECAY IN CHILDREN

LOUIS B. KELSTEN, D.D.S., *Newark, New Jersey**

In pedodontics, nothing can be more disheartening than having a child return in six months with recurrence of multiple caries after extensive and costly work has been done. Unless the dentist who handles children is able to overcome to a marked extent the discouraging problem of dental caries, he is constantly faced with the hazard of having his work undermined with decay and even being held responsible by the uninformed parent.

Therefore, parents should be taught caries prophylaxis. They should be made to understand that the prevention of tooth decay is their responsibility and that as the child grows older unless caries prevention is practiced so many teeth may be involved with huge restorations that prosthesis may be required before the child is twenty. Although the importance of properly restoring a child's mouth cannot be overemphasized, nothing appeals more to a parent than a program of prevention. Besides creating good will, this program can be a vital factor in maintaining a practice because it encourages parents to return with their children for periodic examination.

HISTORICAL ASPECTS OF THE ETIOLOGY AND PREVENTION OF TOOTH DECAY

For centuries men have been aware that tooth decay was caused by the soft refined diet of civilization. In the first textbook on dentistry published in Germany (1530) called *Artzney Buchlein* it was stated that decay was caused by a sharp moisture (meaning acid) formed by food left on the teeth.[1] Pierre Fauchard, considered the father of modern dentistry, in 1728 published his classical work *Le Chirurgien Dentiste ou Traite des Dents* (The Surgeon Dentist or Treatise on the Teeth) in which he stated most emphatically that the little or no care as to the cleaning of the teeth is ordinarily the cause of all maladies that destroy them.[2]

As far back as 1741, Bunon spoke of diet and emphasized the importance of the nursing period in tooth development. Moreover, he felt that nutrition and illness were responsible for dental disease.[3] Thomas Berdmore of London, published in 1768, *Disorders and Deformities of the Teeth and Gums,* in which he claimed the use of sugar to be deleterious.[4]

Robert Woofendale (1775) an English dentist practicing in America, recommended toothbrushing for children.[5] William Robertson of England in 1835 published a small book on caries, *A Practical Treatise on Diseases of the Teeth,* in which he revealed that caries was the result of acid generated by the decomposition of food particles or fluids. In 1839 he indicated carbohydrates as a factor in the etiology of tooth decay. Chapin Harris[6] wrote about his chemical theory of tooth decay which is similar to the modern chemico-parasitic theory. He recommended tooth brushing at least twice a day.

The first thorough study of microorganisms as a factor in the cause of caries was published by Leber and Rottenstein in 1867 and was followed by the work of Milles and Underwood of England. Soon afterward Miller revealed his studies of caries of the dentin and J. Leon Williams and G. V. Black also analyzed the progress of decay in the enamel.[7]

In 1902 Miller published the theory of caries as a result of the action of acid-producing bacteria on carbohydrate food clinging to the teeth. This work has recently been supported by Bunting (1929), Jay (1929), and Becks (1944).[8]

Hooton[9] states that anthropologists determine the identity of a skeleton by means of the teeth which reveal eating

* Chief of Service, Pedodontic Section, Beth Israel Hospital, Newark, New Jersey.

habits. The dietaries of uncivilized people, although inadequate and not well balanced, were fibrous and generally required vigorous mastication. Where a person is civilized, his teeth are likely to show little enamel abrasion but many alveolar abscesses and missing teeth with frequent crowding and malocclusion. However, where the teeth are in normal occlusion without evidence of caries but with worn cusps and exposed dentin, the anthropologist is more likely to believe that they belonged to a person living during a primitive period.

Waugh[10] describing the Eskimos' diet, revealed that their teeth were free of decay and had a marked abrasion. Williams[11] showed how the Eskimos began to experience dental disorders when they came under the influence of civilization. Campbell[12] studying the Australian aboriginal, proves that civilized food habits have made him a victim of advanced caries and broken down dental arches.

In the field of caries prevention Dean and his coworkers (1941) reported the flourides as caries inhibitors.[13] Although fluorine was mentioned as a cause of mottled enamel by Eager (1902), McKay and Black (1916), Churchill (1931), and Smith (1931), it was McKay's work in 1929 which originally revealed the relation between mottled enamel and its resistance to caries.[14] The reduction of caries by the topical application of a 2% solution of sodium fluoride was advocated by Knutson and Armstrong in 1942[15] as well as Bibby (1942).[16] Ast (1943) published his hypothesis of fluorine as an agent in the decrease of caries.[17]

In Michigan, New York, and Wisconsin, the first controlled studies on artificial fluoridation of public water supplies were started (1945). In 1950, after five years of fluoride observations, the United States Public Health Service gave approval to the fluoridation of water as a means of partially controlling tooth decay.

In all civilized countries the tooth brush is commonly used as a means of oral hygiene. With a study begun in 1947, Fosdick[18] showed how the use of the tooth brush decreases tooth decay. The importance of brushing the teeth was corroborated after Stephan[19] (1940) Fosdick et. al.[20] and Stralfors[21] (1948) demonstrated how the very rapid formation of acid occurred after rinsing the mouth with a sugar solution. Therefore, it has been demonstrated that brushing the teeth soon after the ingestion of food is an effective method of reducing tooth decay. For many years this has been substantiated by the clinical observations of practicing dentists.

ACCEPTED METHODS OF PREVENTING TOOTH DECAY

Dental science recognizes two principal preventive measures, namely, the care of the teeth in their formative periods, both prenatal and postnatal, and the inhibition of mouth bacteria which cause decay. By the addition of such compounds as calcium, phosphorous, and vitamin D in the balanced diet of the expectant mother, and by the use of fluoride therapy up to the 15th year, tooth resistance can be improved. In addition, brushing the teeth thoroughly after every meal with accepted dentifrices and the restriction of refined carbohydrates are effective measures in eliminating the causes of decay to a considerable extent.

Before teaching caries prophylaxis, it is advisable to explain to the parent the etiology of tooth decay. Here it should be made plain that there are definite causes of dental caries. Although there are some children without cavities who apparently eat candy and do not brush their teeth regularly, most children are susceptible to dental disease just as they are to any other illness when they violate preventive measures. Moreover, it has been found that children with few cavities become highly susceptible to tooth decay when they begin eating sweets.

In simple language, the dentist should show on a model how retained food on or in between the teeth is converted to acid by the bacteria normally present in the mouth and how the acid decalcifies and eats into the tooth substance. Therefore, tooth brushing after meals should

be included in the habits of personal cleanliness which are commonly taught a child.

Since a small child is unable to brush his teeth properly, the parent's help is required. It is advisable that the parent have a separate brush and that a game be made out of the process. Immediately after every meal the child should rinse the mouth thoroughly and brush his teeth with an accepted dentifrice before a specially placed mirror to encourage his efforts. It has been found that a small child will more readily brush his teeth if he can see what he is doing. He should then rinse again and the parent can use another brush to finish the job. For simplification, the parent should teach the child that the teeth should be brushed from the gum line to the biting surface on the inside and outside, and across the biting surfaces of the teeth. Also, following the last meal the parent should use dental floss.

As soon as the child reaches the second birthday, the above technique should be employed in keeping his mouth clean. As the child grows older and is taught to rely on his own efforts, the mother should gradually withdraw her assistance. However, her supervision is necessary at least until the child is ten years old to insure that the technique of rinsing, brushing, rinsing, brushing will be continued properly so that there is sufficient irrigation to remove food debris from the teeth. It must be emphasized to every parent that the teeth are much too precious to be completely entrusted to the care of a child.

In the infant, upon eruption of the teeth, it is necessary for the parent to clean the small mouth carefully if tooth decay is to be prevented. Obviously, it is advisable that the parent carefully condition the infant to this treatment since at first there may be vigorous resistance. By placing the finger distal to the erupting teeth and forcing the small mouth open, little strength is required in carefully cleaning the teeth with a small tooth brush. Soon the child will readily submit to tooth brushing and when he is older he can be given a tooth brush of his own to assist in the technique described above.

Perhaps to many, cleaning the mouth of an infant may appear unnecessary; however, newly erupted teeth also are susceptible to caries. Moreover, it is desirable that a child acquire the important habit of brushing the teeth as early in life as possible. As Black[22] states, the person who has formed the habit of cleaning the teeth immediately after meals is annoyed until his teeth are brushed following eating. This is a virtue which cannot be overlooked, especially if acquired at a very young age. Areas which are apparently not cleaned should be tactfully pointed out by the dentist so that the method of brushing can be corrected. This service should never be underestimated since it is one of the most helpful that a dentist can render.

However, since many occasions arise in which it is not possible to brush the teeth, as when eating away from home, the mouth should be rinsed thoroughly and dental floss used. In addition, the following suggestions are also recommended:

1. *The elimination of refined foods wherever possible.* Not, just sugar, but white bread, cereals, crackers, cakes, and other foodstuffs cause tooth decay.

2. *Restriction of sweets.* However, since some children unfortunately acquire the craving for pastry and candy early in life, completely prohibiting sweets may be questionable. Such restriction, in addition to being unkind, frequently fails because it has been shown that if a child is denied candy at home, he will get it from his young friends. Therefore limiting sweets to the end of the meal followed directly by tooth brushing may be more practical. However, wherever possible fresh fruits such as apples and oranges should be substituted for candy and pastries.

3. *Elimination of between meal snacks.* Because tooth decay is due to civilized diet, it follows that a child who eats three meals a day will have less decay than one who eats more often

or continually all day. Since it has been shown that the child who is overweight has less resistance to disease, his physical as well as dental health will be improved by restricting between meal snacks.

4. *Avoid eating and drinking at the same time.* In addition to gross soft food deposits, malformation of the jaws may occur since the muscles of mastication and deglutition are improperly used. Normal muscular pressure through proper chewing and swallowing is necessary for the development of the jaws and the correct occlusion and alignment of the teeth. Malocclusion has long been accepted as a factor in predisposing a child to dental caries.

Furthermore, the diet and tooth brushing of every child with caries should be checked. The dietary intake for ten days including between meal snacks and chewing gum should be carefully recorded by the parent. Upon analysis the dietary record and tooth brushing procedures of children with even the most conscientious parents will be found faulty. Often it can be shown that each meal contains one or more items which cause tooth decay. These items should be eliminated if possible and a correct tooth brushing technique instituted.

However, it should be stressed that regular and thorough brushing as well as an improved diet will not eliminate the services of the dentist since every parent will fail in some part of the prescribed routine. Therefore, the parent should be impressed with the importance of regularly consulting the dentist.

299 Clinton Avenue

REFERENCES

1. Black, A. D.: Rise and progress of dentistry. J.A.D.A. 20:1934, Nov., 1933.
2. Prinz, Herman: Pierre Fauchard and his works. Dental Cosmos. 65:829, Aug., 1923.
3. Black, A. D: Op. cit. p. 1935.
4. Weinberger, B. W.: An Introduction to the History of Dentistry. Vol. I. St. Louis, C. V. Mosby Co., 1948. p. 406.
5. Ibid. Vol II. pp. 105-07.
6. Harris, Chapin: The Dental Art, A Practical Treatise on Dental Surgery. Baltimore, Armstrong and Berry, 1839. pp. 73, 77-8.
7. Black, A. D.: Op. cit. p. 1937.
8. Robinson, H. B. G.: Advances in dental science. J.A.D.A. 40:667-8, June, 1950.
9. Hooton, E. A.: Why Men Behave like Apes and Vice Versa. Princeton, Princeton University Press, 1940. p. 91.
10. Waugh, L. M.: Influences of diet on the jaws and face of the American Eskimo. J.A.D.A. 24:1640, 1937.
11. Williams, C. H. M.: Investigations concerning the dentitions of the Eskimos of Canada's Eastern Artic. J. Periodont. 14:34, 1943.
12. Campbell, T. D.: Dentition and Palate of the Australian Aboriginal. Adelaide, Hassell Press, 1925. pp. 81-2.
13. Dean, H. T., Jay, P., Arnold, F. A., and Elvove, E.: Domestic water and dental caries. II. A study of 2,832 white children age 12 to 14 years of 8 suburban Chicago communities. Public Health Reports. 56: 761-792, Apr. 11, 1941.
14. McKay, F. S.: The establishment of a definite relation between enamel that is defective in its structure, as mottled enamel, and the liability to decay. Dental Cosmos. 71:747-755, Aug., 1929.
15. Knutson, J. W., and Armstrong, W. D.: The effect of topically applied Sodium Fluoride on dental caries experience. Public Health Reports. 58:1701-1715, Nov. 19, 1943.
16. Bibby, B. G.: New approach to caries prophylaxis: Preliminary report on use of flouride applications. Tufts D. Outlook. 15:4, 1942.
17. Ast, D. B.: The caries-fluorine hypothesis and a suggested study to test its application. Public Health Reports. 58:857, June 4, 1943.
18. Fosdick, L. S.: The reduction of the incidence of dental caries. I. Immediate tooth-brushing with neutral dentifrice. J.A.D.A. 40:133, 1950.
19. Stephan, R. M.: Changes in hydrogen ion concentration on tooth surfaces and in carious lesions. J.A.D.A. 27:718, 1040.
20. Fosdick, L. S., Campaigne, E. E., and Fencher, C.: Rate of acid formation in carious areas: The etiology of dental caries. III. Dent. Journal. 10:85, 1941.
21. Stralfors, A.: Studies of the microbiology of caries. II. The acid fermentation in the dental plaques in situ compared with lactobacillus count. J. Dent. Res. 27:576.
22. Black, G. V.: Special Dental Pathology. Chicago, Medico-Dental Publishing Co., 1920. p. 438.

THE DENTIST'S ROLE IN THE DETECTION AND PREVENTION OF SYSTEMIC DISEASE*

ISADOR HIRSCHFELD, D.D.S., *New York City*

The dentist's main interests are essentially the prevention, detection and treatment of dental and periodontal disease. In conscientiously carrying out these functions, he indirectly serves in the field of preventive medicine, inasmuch as he helps avert the possible systemic end results of a sick or malfunctioning masticatory outfit. The oral cavity with which he is constantly confronted, with its lining of only several square inches of mucosa, has the potentiality of reflecting symptoms of various systemic diseases often before the patient or even the physician is aware of their presence. The dentist, therefore, is also in a strategic position to observe the appearance of the mouth generally, i.e., the tongue, palate, cheeks, lips, etc., all of which in addition to the gingivae and other periodontal structures, very frequently reflect not only advanced, but even early, symptoms of diseases of the body.

Because the dentist's patients come to his office frequently, at regular intervals, he is in a position to detect such symptoms early. This may prove instrumental not only in effectively eliminating or controlling the condition, but even, as in some cases, in preventing unnecessary loss of life.

On the other hand, most physicians see their patients only occasionally, often only through an emergency requirement. They, therefore, have very little opportunity to make detailed observation of the oral cavity and so, are likely to miss early mouth symptoms of body disease. It is not necessary to enumerate all the above systemic disorders, or to refer to their basic origin. However, it is pertinent to reflect that while some of these diseases are of a benign nature, others may prove to be of a severe type and still others possibly of fatal termination, thus making their early detection important. This, naturally, also applies to pre-cancerous or incipient oral cancerous indications and their probable causative traumatizing agencies. Thus, it is at once obvious that the dentist well equipped for such early detection is, in a sense, in a position to practice in his field, a form of preventive medicine not within the province of any other member of the healing art.

In order to be proficient in this direction, the dental student should necessarily not only receive intensive training in the recognition of oral symptoms of systemic disease, but also, for the purpose of differential diagnosis, be thoroughly familiarized with even the minutest details of the anatomy of every portion of the mouth, and their variations.

Considering these facts, it would seem that the dental student, in addition to being taught the science and art of dentistry *per se,* should also be indoctrinated with the moral responsibility that is evidently his alone, for such early detection of the above symptoms. This would indeed be an invaluable general health service for which the patient might logically depend on the dentist more than on the physician.

Some of the systemic diseases, the symptoms of which often appear in the mouth before anywhere else in the body, are such usually fatal ones as pemphigus and leukemia. One might question what good their early detection would serve since the patient is going to die anyhow. In this respect, it may be stated that these conditions, like others that have in recent years been conquered, will no doubt in the not too distant future, be similarly controlled or eradicated through the comparatively rapid progress in medical research. In the meantime, for obvious reasons, the sooner the dentist directs the patient to the physician, the less embarrassment will the dentist experience.

* Presented as an introduction to an illustrated lecture at the Mid-Winter Meeting of The American Academy of Dental Medicine, New York, N. Y., December 2, 1951.

Two of the most outstanding examples of diseases of which the public has been made particularly conscious in recent days are cancer and diabetes.

The mouth is one of the more frequent sites of the incidence of cancer. A large percentage of such cases could be either averted through the dentist's early alertness and removal of the specific local irritant, or, when incipient stages of a cancerous lesion are already established, through early reference to a specialist for appropriate expeditious treatment. Since time in such cases is a most essential element, the importance of such early detection by the dentist is quite obvious.

While the wide publicity currently given cancer is undoubtedly most valuable as an aid in decreasing its incidence and in its early detection, it has at the same time, however, increased the number of cancerphobia patients, some of whom are actually driven to a point of desperation. Not infrequently, such individuals go to the dentist for reassurance regarding what they consider mouth symptoms of malignancy. Obviously a dentist who is better versed in oral diagnosis as well as in the minute details in anatomy is in an advantageous position for allaying the terrible fears that prompt the patient's visit.

The public's attention has recently been called repeatedly to the fact that there are approximately a million people in the United States who have diabetes but are entirely unaware of it. Frequently such persons have recognizable gingival or other periodontal symptoms that highly suggest the associated diabetes. Brief questioning by the dentist regarding some of the possibly coexisting, generally known symptoms, and his immediate referral to the physician for tests for a definite diagnosis, have on many occasions proven most invaluable.

In closing, may I repeat that in addition to being instructed in the science and art of dentistry *per se*, dentists should receive at least equally intensive instruction in the detection of oral symptoms of systemic disease, since there are evidently no other members of the healing art, who are in a similarly favorable position to cover this field effectively.

FOUR RULES FOR SOUND DENTAL HEALTH

Dr. LeRoy M. Ennis, of Philadelphia, Association president, recently recommended the following four-fold program as a "practical means of providing children with sound dental health:"

1. A well-balanced diet with consumption of sweets kept to a minimum. It is the sugar that is the prime cause of dental decay.

2. Proper toothbrushing habits that should be learned early. This means brushing the teeth within 10 minutes after eating.

3. Early detection and treatment of dental disease. This will prevent larger dental ills later on. Neglect may produce serious dental problems which continue throughout life.

4. Either access to drinking water from a community water system containing the proper amount of fluorides for tooth decay prevention or application of sodium fluoride to the child's teeth at periodic intervals. Children who drink fluoridated water from birth have from one-half to two thirds less tooth decay than those who drink fluoride-free water.

ADDRESS BY DEAN D. P. MOWRY UPON RECEIVING HONORARY MEMBERSHIP IN THE AMERICAN ACADEMY OF DENTAL MEDICINE

I am deeply grateful to the Academy of Dental Medicine for this Honorary Membership. While I appreciate that there is some excuse for personal pride and I most certainly appreciate that it is a menace to my native humility, I feel that the real compliment is to the sincere and faithful teachers of the Faculty of Dentistry of McGill University and it is fundamentally they who are honoured this evening.

It has always been difficult for me to think of the teeth and their lesions as a problem apart from the rest of the body. Medicine is concerned with the body as a whole. Dental medicine is concerned with the inter-relationship of teeth and body. At this point, I would like to stress the hope that our interest in dental medicine is based on our faithful concern for the welfare of the dental profession. We are interested in medicine chiefly in order that we may be better dentists. To be specific, I hope that interest in clinical laboratory tests and diagnosis, (basic and necessary as they are), will not detract from the reputation of North American dentistry, namely, that we *do* something for the patient rather than just *talk* about it.

The past fifty years has seen a great change in the way of life. This has been brought about chiefly by what is known as the machine age. It made possible the evolution of the dentist from the barber surgeon to the gold crown and bridge technician of the first decade of our country.

Forty-two years ago — to be exact, on October 3rd, 1910, William Hunter, M.D., Edin., F.R.C.P. London, delivered an address at the opening of the session of the Faculty of Medicine of McGill University, Montreal. The subject of this address was "The Role of Sepsis and of Antisepsis in Medicine." I think I am correct in stating that this powerful presentation of the menace of sepsis about the teeth of apparently healthy people marked the end of the era of mechanical dentistry in the narrow sense and the beginning of true clinical dentistry. The importance of the prevention of surgical sepsis was well known in 1910 but listen to these lines by Hunter:

"If the doctor were asked how the matter stood with regard to the prevention of medical sepsis, he would probably say that that was a matter he unfortunately could not control."

He continues:

"Now, it is with this whole conception of the sphere of activity and importance of sepsis in medicine that my whole work for many years joins issue"—

"In my clinical experience, septic infection is without exception, the most prevalent infection operating in medicine, and a most important and prevalent cause and complication of many medical diseases. Its ill-effects are widespread and extend to all systems of the body. The relations between these effects and the sepsis that causes them are constantly overlooked, because the existence of the sepsis is itself overlooked. For the chief seat of that sepsis is the mouth; and the sepsis itself, when noted, is erroneously regarded as the results of various conditions of ill health with which it is associated not, as it really is, an important cause or complication."

"The patient is quite willing to describe and discuss with the doctor all his other troubles and complaints, to which, as he says, he is a martyr; his indigestions, headaches, liver troubles, his rheumatism, his gout, and his 'neuritis.' But the subject of his teeth is his own affair, one between his dentist and the

* Presented at the Annual Meeting of the American Academy of Dental Medicine, Montreal, May 30th, 1952.

doctor regards it as such. It is a matter of teeth and dentistry with which he cannot deal. He goes on to say — What I desire to impress upon you students, and all students entering the profession, and all those already engaged in the practice of the profession, is, it is not a matter of teeth and dentistry. It is an all-important matter of sepsis and antisepsis that concerns every branch of the medical profession and concerns very closely the public health of the community."

Well I do not suppose we can find much fault with that but just listen to these choice words, quoting Hunter again, —

"No one has probably had more reason than I have had to admire the sheer ingenuity and mechanic skill constantly displayed by the dental surgeon. And no one has had more reason to appreciate the ghastly tragedies of oral sepsis which his misplaced ingenuity so often carries in its train. Gold fillings, gold caps, gold bridges, gold crowns, fixed dentures, built in, on and around diseased teeth form a veritable mausoleum of gold over a mass of sepsis to which there is no parallel in the whole train of medicine or surgery. The whole constitutes a perfect gold trap of sepsis of which the patient is proud and which no persuasion will induce him to part with. For has it not cost him much money, and has he not been proud to have his black roots elegantly covered with beaten gold, although no ingenuity in the world can incorporate the gold edge of the cap or crown with the underlying surfaces of the root beneath the edges of the gums? There is no rank of society free from the fatal effects on health of this surgical malpractice."

Sic transit gloria mundi.

I will conclude my quotations from Hunter with this powerful paragraph:

"After ten years experience of the nature of these effects and of the difficulties encountered in removing them, I feel that the only solution of the difficulty may best be described in the terms employed by Huxley, modified to suit this particular case":

" 'There can be no doubt that the future of Oral Pathology and treatment, and therefore of practical dentistry, depends upon the extent to which those who occupy themselves with these subjects are trained in the principles and impregnated with the fundamental truths of oral sepsis and oral antisepsis.' "

All of this, my friends, was forty-two years ago. We have come a long way since. The roentgenogram has come into routine clinical use by all modern dentists. The periodontist has been forced to study physiology, histology, bacteriology and pathology in order to obtain results in his field of action. Surgery has learned not only to popularize the basic ideas of antisepsis but also to respect the responsibility relative to trauma and shock. Probably one of the most spectacular changes in recent years is the achievement of the endodontist in changing root canal therapy from an empirical, haphazard operation to a scientific technique involving all of the branches of medical science. The relation of morphology to function with all its implications to the occlusion from comparative dental anatomy to its application in operative dentistry and fixed prosthesis is constantly forcing dentistry into the fold of the medical sciences where it properly belongs. I do not mean by this that we should be a department of medicine but rather an important branch. As a specific example of this, I quote the summary of a presentation before the Section on Periodontia of the American Association of Dental Schools last March. It is by Dr. M. B. Engel and is as follows:

"The periodontal tissues are largely of connective tissue origin. The extracellular ground substance of connective tissue contains an aggregated carbohydrate-protein complex which is very labile in a biologic sense. The physical and chemical states of the ground substance vary with physiologic and pathologic states. In this way, endocrine changes, local irritation or the interaction of these can

cause alteration in the periodontal structures. A departure from the normal state, caused by a systemic factor may not be clinically evident until local factors are superimposed. Local treatment might return the tissue to apparent clinical health leaving the underlying abnormality in the connective tissue uncorrected."

"It is implicit in this view that an understanding of the basis of cellular activity and of the biology of connective tissue should be among the first objectives in the teaching of periodontia."

We are just discovering in our modern world that life today is too complicated for complete centralization. We are finding that efficiency lies in decentralization. There must, however, be a central philosophy, a basic aim and purpose. This central core of the wheel with many spokes is the profession of dentistry. All of the departments, societies, academies, associations, schools, are the decentralized parts which must contribute if the composite whole is to be worthy of its tradition and its future. For this reason one must constantly be careful that the part does not tend to become greater than the whole.

The American Academy of Dental Medicine has set itself a magnificent goal. One might almost say in the words of religion — "some dim far off divine spirit." However, unlike the theories of religions, we can do something about it. In fact, ladies and gentlemen, the Academy has done much in stating its objectives and gathering together a band of keen, well trained, curious workers. However, I must voice a little fear that many of your able workers may not be sufficiently decentralized. What do I mean by this? Most respectfully, I suggest that the program involved in your Academy requires terrific concentration and research. If a man is following problems in dental medicine, I suggest that if he is thorough he is a genius if he can also follow two or three other specialties at the same time. Somewhere along the line arrangements should be made to free key men so they can concentrate on their individual subjects and a small group would work to coordinate the whole.

I think you will all agree that the present organization of dentistry in relation to society, leaves much to be desired. Decentralized groups such as the Academy of Dental Medicine, are contributing much to the coordination of present knowledge. But where do we stand in relation to research as to the cause and prevention of disease? In fact, what precisely is the profession of medicine doing in this field? I respectfully suggest that the healthy person, one immune to disease and filled with vitality, is the interesting object of study rather than the diseased. Do we know what foods will produce sound teeth in bodies free from disease? Do we know how to organize our society so that we may work cooperatively and happily with the minimum of fatigue, yet with zest for life? The answers to these questions may be right on our doorstep and I think it possible and indeed, logical, that this Academy of Dental Medicine is the appropriate body to open the door to the New Day.

"Behold we know not anything;
I can but trust that good shall fall
At last — far off — at last to all,
And every winter change to spring."

Tennyson.

ADDRESS BY DEAN ERNEST CHARRON UPON RECEIVING HONORARY MEMBERSHIP IN THE AMERICAN ACADEMY OF DENTAL MEDICINE*

Would that you had mentioned, dear Dr. Miller, what I would have liked to do instead of what I actually did. I wish to recall in a very few words the generous help you have extended to our Faculty. We owe you much gratitude for the willingness with which you have welcomed, at New York University, some of our graduates who, thanks to your postgraduate course, will greatly increase their efficiency as teachers and, thereby, their usefulness to the profession at large.

It is for me a pleasant duty, on this occasion and before a gathering of leaders in the field of Dental Medicine, to express my appreciation and my thankfulness to my prominent confreres who have kindly elected me to honorary membership in the American Academy of Dental Medicine. I am all the more sensible of this distinction as it redounds to the honor of the Faculty of Dental Surgery of l'Université de Montréal.

I realize that it is a great privilege and I am fully conscious of what may be regarded as daring on my part in addressing this meeting, when no doubt I am expected to have much to say about the vision of the pioneers who dedicated themselves to the betterment of our profession.

I confidently hope that I may assume that the story and record of those men whom you honor as fellows of your Academy are so well known to you all that it would be presumptious on my part to indulge in a repetition of their record, inspiring as it is to all who have in any measure benefitted by their example.

At all events, I recall that a French moralist describes the gentleman as a person who is always willing to learn something he knows from one who knows nothing whatever about it. Before this distinguished audience, such a definition encourages me to say a few words about Dental Medicine.

Gratitude should move us to heed the ancient philosopher's exhortation: "Let us praise famous men and the fathers that begat us," and I am sure that it may be taken for granted that all those who are in any way associated with this Academy cherish in their hearts the courage and faith which led to its foundation.

The ideals of your Academy are aptly set forth in its constitution. I would like to quote its object. "To promote the study and dissemination of knoweldge of the cause, prevention and control of diseases of the teeth; their supporting structures and adnexa and related subjects; and to foster and promote a better scientific understanding between the fields of dentistry and medicine."

The cooperation of dentists with physicians which you recommend, will doubtless go a long way in improving teaching in Dental Schools and, as a consequence, in enabling the dental practitioners to participate more efficiently in the promotion of public health.

I believe it was Sir William Osler who placed upon the title page of a notebook intended for the students of his first class in clinical medicine, at the Montreal General Hospital, the following quotation from Freud:

"The knoweldge which a man can use is the only knowledge which has life and growth, and converts itself into practical power. The rest hangs like dust about the brain or dries like raindrops off the stones."

We, in Canada, endorse this opinion and we have made every effort to render

* (Editors note) In reply to presentation of Honorary Membership by Past President Samuel Charles Miller at the Montreal meeting, May 30th, 1952.

our theoretical and practical teaching as effective as it is humanly possible.

We find a great help in the fact that all biological sciences are taught in Medical Faculties and the Faculties of Science, as the case may be, and that our students, far from being treated as "poor cousins," are on the same footing as regular students of these Faculties. This cooperation is most beneficial not only to teaching itself, but to the community as well. May I add that, in our hospitals, the medical and the dental staffs have the same status.

Ninth Annual Seminar for Study and Practice of Dental Medicine

Two hundred dentists, including top dental-medical researchers will be in attendance at the Ninth Annual Seminar for the study and practice of dental medicine set for the Desert Inn, Palm Springs, California, October 26 through October 30, 1952.

Advance registration according to an announcement by Dr. Hermann Becks, President and founder of the Seminar, indicate a capacity turn-out for the five-day study session. Included in the lecture-packed program to be discussed and analyzed at the meeting are the following subjects:

Herbert M. Evans, M.D., Berkeley, California: Multiple congential abnormalities resulting from acute folic acid deficiency during gestation. The effect of hypophysectomy during the first days of life. Relations of the pituitary and thyroid to osteogenesis. Interrelations of the pituitary and pancreas.

W. Rettberg, M.D., Denver, Colorado: Symptoms and signs referable to the oral cavity in blood dyscrasias—red cell disorders. Disorders of the white cells and lymph tissues associated with manifestations in the oral cavity. Hemorrhagic disorders as seen in the oral cavity.

R. Reynolds, M.D., San Francisco, California: Recent advances in the field of endocrinology. Constitution and disease—heredity and its place in etiology. The role of hormones, vitamins and antibiotics in the treatment of dental disturbances.

W. Wainwright, D.D.S., M.S., Chicago, Illinois; The potentials of atomic energy in the field of dentistry, the need for dental research with radioactive tracers, and a survey of current dental studies with radioactive materials.

H. Sicher, M.D., Chicago, Illinois: Biologic processes of oral tissues and their practical application to orthodontics. The problem of attrition and its correlation to tooth eruption. Muscle physiology and the temporomandibular joint.

H. Becks, M.D., D.D.S., San Francisco, California: A three year study of the effects of topical application of sodium fluoride in young adults.

These and other subjects along the same lines will be discussed and all seminar lecturers will participate in a round table forum covering the application of the subjects to the practice of Dental Medicine.

Applications and full information on the Seminar program may be secured by writing Miss Marion G. Lewis, Executive Secretary, Room 200, Hooper Foundation, University of California Medical Center, San Francisco 22, California.

ACADEMY PROCEEDINGS

Annual Report of the President*

Through the sudden and untimely passing of Gordon R. Winter in July of 1951, it devolved upon me as President-Elect to assume the office of President of our American Academy of Dental Medicine. This, of course, I did willingly ever mindful of the challenge and responsibility connected with this high office. I trust your confidence has been justified.

At the outset of this report, I should like to thank most sincerely the past and present officers, each and everyone, for their invaluable help and assistance which has been available to me every step of the way this past year.

In the reports that you will hear and those which have been printed and you have in your possession will be a complete and detailed list of accomplishment of the Officers and Committee Chairmen. I shall not include any elaboration of them in this report.

There are, however, accomplishments and there is growth in the Academy which is pleasant to report upon and to call to your attention.

Our Meeting here in Montreal is a special accomplishment. I am sure that this, our 6th Annual Meeting, the first to be held outside the confines of the United States will be a memorable affair. The Montreal Section has worked diligently and our hearty thanks to each one of you.

Your Board of Trustees has met regularly for consideration of the business of the Academy and with almost perfect attendance at each meeting. Everyone contributed in a manner that bespeaks his genuine feeling of responsibility to the welfare of the Academy.

The excellent financial condition of the Academy is evidence of your continuing interest.

Our membership continues to grow. Upwards of fifty new names have been presented this year and at the close of this meeting our roster should stand at approximately 525 members.

Reference to our Journal is made with a personal feeling of great pride as is also the conduct and program of our December Meeting. To prepare and present this fine Journal and to plan for and execute our Semi-Annual Meeting requires the sacrifice and constant effort of many men. The Chairmen are selected because of their excellent ability and together with the members of their large Committees should and do receive our most hearty thanks.

Our Constitution and Directory just published and in your hands is the result of many hours of hard work and thoughtful consideration on the part of this Special Committee. From time to time there will be additional members' names, Constitutional changes and pertinent data to be inserted and serve as addenda to this publication. It is hoped that you will conserve your copy, add these inserts and use it freely. One of its most important functions can be as a guide in referring patients who have had to leave a member's practice and move elsewhere. Patients welcome the knowledge that they are being referred by their own dentist to one whose competence and ability is proven by virtue of their listing in the membership Directory of the American Academy of Dental Medicine.

Through the Graduate Award Committee's efforts, the name of our Academy is constantly before the Deans of our Dental and Medical Schools. So far we have given 346 Proficiency Awards. The recipients will doubtless become members of our Academy in time. This is an undertaking that merits our continued support.

Two Charters are to be presented today to newly formed Sections; one in Maryland, another in Pennsylvania. These two organized groups are welcomed into the growing Academy with the earnest hope that they will thrive and become enlarged by the election of new and selective members. The life of the Academy and the benefit derived from membership in it lies in the activity of the Sectional groups.

Several Constitutional changes are to be presented and it is hoped that you are sufficiently familiar with them to aid you in your voting.

A Committee to consider action requesting the adoption of a Board of Certification in Dental Medicine has been functioning. The Committee on Dental Education in the American Dental Association advises us of certain requirements. We shall proceed in the proper manner after thorough study and consideration of this important matter.

Your President did not indulge himself in the pleasantries of visitation to Sections save one, namely New Jersey. At the risk of being considered somewhat prejudiced, it is a plesaure to report a constant and ever growing enthusiasm in that group. They publish a fine Bulletin, in fact, the only one I have received to date from any Section. I can assure you that your President,

* Read at the Annual Meeting, May 30, 1952.

President-Elect and Vice President will be honored to officially visit a Sectional gathering when advised of the meeting and invited.

There are goals which we hope to attain. May I offer the following suggestions and ask your consideration of same.

1. Many well qualified men should be considered and invited into membership. The plan of proposal for membership should be carried out as suggested in the amendments as submitted known as Article 3 Section 8 and 9 and Article 4 Section 12, if passed at this meeting.

2. Finances permitting our Journal to be expanded as this is the most general contact the membership has with the Academy. The Academy should be known by the quality of its publication.

3. Considering the office of Secretary as a permanent office.

4. Considering the office of Treasurer as a permanent office.

a. These two offices require training and familiarity with the working procedures of the Academy. This experience is not gained readily but once it has been acquired it should remain the duty of one person to administer until a successor has been requested or a change deemed necessary.

5. It might be well to build the Scientific portion of our future meetings around a specific topic and cover all aspects as competely as possible.

6. Continued study is urged in the matter of Aid to Dental Students.

7. Every effort should be made to enroll as members those who have received Graduate Award Certificates.

The recent graduate in order to encourage membership and active participation might be given some financial consideration in the matter of initiation fee. This, of course, to be only for a short period agreed upon following graduation.

Recently this Academy was referred to as one in which membership was an honor and a challenge: a group that was ten years ahead of its time. Do you believe that that is true? If you do, let us go forward with continuing and even greater zeal.

Thank you.

Respectfuly submitted,
Harold E. Gelhaar, *President.*

American Academy of Dental Medicine Elects New Officers, Honorary Members and Fellows; Adds Two New Sections

Dr. Harold R. Gelhaar, Upper Montclair, N. J., was installed in office as president for the fiscal year 1952-'53 of the American Academy of Dental Medicine at our annual meeting held at the Mount Royal Hotel, Montreal, Canada, May 29 to 31.

Dr. Gelhaar became acting president of the Academy last year when Dr. Gordon R. Winter, Philadelphia, then chief executive of the group, succumbed to a heart attack. At the Montreal meeting he became the incumbent by natural succession as former president-elect.

Others elected to serve with Dr. Gelhaar are: Dr. Alvin H. Berman, Baltimore, Md., president-elect; Dr. William M. Greenhut, New York, Secretary (re-elected); Dr. George C. Stewart, Philadelphia, Pa., treasurer; and Dr. Allan N. Arvins, New York, Journal Editor (re-elected).

At the meeting, the Academy conferred honorary memberships upon Dr. Ernest Charron, Dean, University of Montreal Dental College, and Dr. D. Prescott Mowry, Dean, Faculty of Dentistry, McGill University. Fellowships were awarded to Dr. S. Leonard Rosenthal, Philadelphia; Dr. William M. Greenhut, and Dr. Louis R. Burman, New York. It also admitted two new sections, Philadelphia and Baltimore.

The annual session, at which the Montreal Section played host, featured outstanding specialists in discussions of the newest developments in dental medicine, including psychosomatic dentistry, use of radioactive isotopes, mouth rehabilitation, oral carcinoma, and periodontia. More than 150 members from all parts of the western hemisphere attended the three-day session.

Committee Report on President's Message

We the President's Committee, have thoroughly analyzed the President's Report and feel he is to be commended for his efforts on behalf of the Academy. We consider his report as one worthy of considerable commendation.

We commend the groups in Maryland and Pennsylvania and extend a hand of welcome to them and hope that they will become virile members of the Academy of Dental Medicine.

This Committee is very happy to learn that consideration is being given to Certification in Dental Medicine by the American Dental Association.

Concerning the President's suggestions:

1. We recommend that the whole matter of membership be referred to a joint committee composed of the Constitution Committee and the Membership Committee to consider a more complete plan for membership requirements and application procedure.

2. We are in agreement with the President and hope that the Journal can be expanded.

3. and 4. It is the considered opinion of our Committee that a change as suggested in the President's message might possibly bring about a situation or situations which would be incompatible with the good fellowship and harmony of our Organization.

5. We suggest that the Scientific Program be left to the discretion of our Program Chairman.

6. We wish to commend Dr. Rosenthal on his report on Student Aid. It is the opinion of this Committee that his recommendations be accepted when our Trustees see fit.

7. We are heartily in accord with the President regarding enrollment of those who have received Graduate Certificates. In regard to initiation fees, we fear, however, there would be conflict with the Constitution and therefore this matter should receive consideration of the Membership Committee.

Respectfully submitted,

George A. Bruns, Massachusetts, *Chairman*
Gerard Plamondon, Canada
Conrad Godin, Canada
Louis B. Kelsten, New Jersey
Philip Edelman, Brooklyn, New York
Joseph S. Landa, New York City, N. Y.
John A. Sherman, Canada.

IN APPRECIATION OF THE MONTREAL MEETING:

May 31, 1952: The past three days have been both rewarding and encouraging. The benefits of this meeting have far exceeded our most hopeful expectations.

You will recall the story of the flea on the chariot axle who, on looking back, said proudly, "Look what a dust I have raised." The members of the American Academy of Dental Medicine who have attended this meeting cannot be so complacent. We cannot leave this productive meeting with a feeling of a sense of achievement, stimulation and growth, content with the notion that it was simply our presence here and our capacity and willingness to learn that made our stay at this meeting worth while.

We need to express our appreciation for the heartwarming intellectual and emotional stimuli you Montrealers have given us. You have widened our professional horizons by your unified approach and action in the planning and conduct of this valuable and eminently successful annual meeting.

Under the able and stimulating guidance of Wilfred Johnston, Albert Laferriere and H. H. Pearson with Drs. Archambault, Rosen and Plamondon as committee chairmen you have individually and as a section headed by your President Max Goldenberg helped us rededicate ourselves to the work which is our guiding light. I hope you feel it was worth the gloom, worry and travail that is a natural part of every large and successful undertaking.

By your fine understanding of life you have provided for all of our needs while we were here in your midst. We see that you respect all human needs, recognizing especially the valid claims of the human personality. But you recognized that a building could not be an inspiring edifice unless it saw the light of day. You did more than recognize the needs of Dental Medicine: you have, in your well-planned program included expert discussors of all the integral factors entering into the total needs of our patients.

And you—as the Montreal Section of the American Academy of Dental Medicine—transcended the limitations of money availability, rules and time and have brought us a program which helps us understand the whole man.

You have given us in this meeting expert information on biology medicine, physics, psychology and mechanics. You have, in the few brief hours available to you lifted away the barriers of these separate departments of knowledge and have presented them as one integrated whole. You have shown us how to help our patients better by seeing them as human beings with personal, cultural and socio-economic pasts, current problems and future potentialities. Your lectures have taught us what people are and how they can change and grow to better appreciate and enjoy the values and great benefits of dental science and care.

You have at this meeting shown that dental and periodontal disease is the most prevalent chronic disease the tendencies to which lie latent in every mouth. You have left us with a better understanding of how to free our sick patients of the diseases which sap energy, debilitate, enervate and disable them. We will return to our work with a knowledge of understanding and serving our patients better and with a means to help them live longer and more virile lives. You have, in brief, given us a renewal in our work and a heightened sense of achievement and belonging in our chosen fields and in this great Academy of Dental Medicine.

I wish also at this time to express the thanks of the membership to Louis Burman, your National Representative to this annual meeting for his part in planning the program.

J. L. B.

Lieutenant Governor of Quebec Greets Academy Officers

His Excellency, the Honorable Gaspard Fauteux greeting the Officers of the American Academy of Dental Medicine at the Montreal Meeting. Left to right, Lt. Col. Papineau, Drs. Gerard Plamondon, Harold Gelhaar, Lieut. Gov. Fauteux, Albert Laferriere, William Greenhut, Allan Arvins, Louis Burman, and Alvin Berman.

AMERICAN ACADEMY OF DENTAL MEDICINE

MEMBERS ELECTED AT THE ANNUAL MEETING, MAY 30, 1952

Active

JEROME B. ACKERMAN
New York, N. Y.

KURT BONIN
Johannesburg, S. Africa.

IRVIN FRANCIS BUCK
Washington, D. C.

HERBERT N. D. CAHAN
Ventnor N. J.

RALPH CARRON
Brooklyn 14, N. Y.

ABRAM I. CHASENS
Manville, N. J.

MEYER COHEN
Brooklyn 8, N. Y.

SAMUEL S. COHEN
Cleveland 6, Ohio.

HARRY J. COPPERTHWAITE, JR.
Red Bank, N. J.

CARLOS DE CASTRO
Bogota, Colombia.

ANTHONY F. DEVITO
Asbury Park, N. J.

O. WALTER DONNENFELD
St. Albans 2, N. Y.

JOSEPH J. D'ONOFRIO
East Orange, N. J.

HARRY W. F. DRESSEL
Baltimore 28, Md.

JULIUS H. EDELSTEIN
Brooklyn, N. Y.

FLOYD W. ETCHISON
Port Arthur, Texas.

EDWARD CURTIS FUNK
Portland 14, Oregon.

JULIUS GELLER
Brooklyn 17, N. Y.

A. EDWARD GINDEA
Brooklyn, N. Y.

SANFORD SINCLAIR GOLDEN
Los Angeles 24, Cal.

MARVIN M. GRAHAM
Baltimore 15, Md.

Active

MARSHALL I. KADER
Baltimore 2, Md.

BARNETT KESSLER
New York, N. Y.

ALBERT S. LOEWENSON, JR.
Baltimore 2, Md.

CHARLES E. LOVEMAN
Baltimore 1, Md.

EDWARD J. McKENNA
Red Bank, N. J.

HERMAN MEDAK
Washington, D. C.

WILLIAM MEYER
Yonkers 2, N. Y.

CARLYLE S. MILLER
San Gabriel, Cal.

GEORGES PELLETIER
Montreal, Canada

GEORGE MORRELL PRINCE
Pasadena 1, Cal.

LEONARD RAPOPORT
Baltimore 11, Md.

AARON SCHAEFFER
Baltimore, Md.

EUGENE J. SICILIANO
Allenhurst, N. .

EDWARD J. SLOAN
New Rochelle, N. Y.

HENRY BRUCE SQUIRES
Ottawa, Canada

ELMO WILSON TUCKER
Seattle 1, Washington

DAVID HERBERT WILLER
Baltimore 5, Md.

JOSEPH B. ZELLER
New York 38, N. Y.

Honorary Members

ERNEST CHARRON
Montreal, Canada

DANIEL PRESCOTT MOWRY
Montreal, Canada

AMERICAN ACADEMY OF DENTAL MEDICINE ANNUAL AWARD

Upon recommendation by their respective medical and dental colleges the following senior students have been nominated for the Award for Proficiency in Dental Medicine given annually by the American Academy of Dental Medicine. This award consists of a duly inscribed certificate and a five year subscription to the Journal of Dental Medicine.

DENTAL SCHOOLS

Nominee	*Recommending Officer and School*
DR. JOHN MALLETT BARRON 871 Union Avenue, Memphis 3, Tennessee.	James T. Ginn, Dean, University of Tennessee, College of Dentistry.
VIRGIL DALE BROGAN 2315 Daleford N.E., Canton, Ohio.	Wendell Postle, Dean, College of Dentistry, Ohio State University.
WILLIS R. BROWN 411 Hamilton Place, Ann Arbor, Michigan.	Dr. F. D. Ostrander, University of Michigan, School of Dentistry.
JOHN C. BRUNDIGE 818½ Forest Avenue, Evanston, Illinois.	Charles W. Freeman, Dean, Northwestern University, Dental School.
ROMAINE R. BRUNS 832 N. 13th Street, Milwaukee 3, Wisconsin.	O. M. Dresen, Dean, Marquette University, School of Dentistry.
CHARLES DAVID CARTER 129 East Broadway, Louisville, Kentucky.	Raymond E. Myers, Dean, University of Louisville, School of Dentistry.
GILBERT DiLORETO 5719 Buffalo Court, Detroit 12, Michigan.	Rene Rochon, Dean, University of Detroit, School of Dentistry.
THOMAS LeROY DONOHOE 1803 S. Compton Avenue, St. Louis, Missouri.	L. R. Main, Dean, St. Louis University, School of Dentistry.
GUY L. EMMONS 1588 Charles Street, Springfield, Ohio.	Russell A. Dixon, Dean, Howard University, Dental School.
WALTER C. ERVIN, Jr. 1814-A Kenmore Avenue, Buffalo 23, New York.	Leon J. Gauchat, Dean, University of Buffalo, Dental School.
JOHN M. GABEL 5435 South 28 Avenue, Omaha, Nebraska.	James H. Pence, Dean, Creighton University, School of Dentistry.
HAROLD L. GODSHALL 191 South Los Robles, Pasadena, California.	Robert W. McNulty, Dean, University of Southern California, Dental School.
DANIEL GRANT 180 South Street, New York, New York.	Claus F. Hink, Acting Dean, New York University, College of Dentistry.
JOHN HOWARD HOGELAND College of Dentistry, Iowa City, Iowa.	A. W. Bryan, Dean, State University of Iowa, College of Dentistry.
LOUIS DANBY JOHNSON Meharry Medical College, School of Dentistry, Nashville 8, Tennessee.	William H. Allen, Dean, Meharry Medical College, School of Dentistry.
HARRY C. LUNDEEN Amery, Wisconsin.	William H. Crawford, Dean, University of Minnesota, School of Dentistry.
WILLIAM F. MacDONALD 238 Danforth Avenue, Jersey City, New Jersey.	C. V. Rault, Dean, Georgetown University, School of Dentistry.

Nominee	*Recommending Officer and School*
KEITH R. MARCROFT 1949 Douglas Street, Salt Lake City, Utah.	O. W. Brandhorst, Dean, Washington University, School of Dentistry.
EARL L. MOORE 1121 West Michigan Street, Indianapolis, Indiana.	Maynard K. Hine, Dean, Indiana University, School of Dentistry.
HOWARD B. OGDEN, JR. 4515 Live Oak Street, Dallas, Texas.	John A. Cameron, Acting Dean, Baylor University, College of Dentistry.
JAMES HULEN ROBNETT 1210 Wentworth, Houston, Texas.	Frederick C. Elliott, Dean, University of Texas, Dental Branch.
ROBERT MARTIN RODGERS 9 Wilfred Street, Chicopee Falls, Massachusetts.	C. D. Marshall-Day, Dean, Tufts College Dental School.
MILTON SILVER 1210 Ninth Avenue, Huntington, West Virginia.	Lawrence E. Van Kirk, Dean, University of Pittsburgh, Dental School.
JOHN BRIGHT SOWTER 622 Witthill Road, Ridgewood, New Jersey.	Lester W. Burket, Dean, University of Pennsylvania, School of Dentistry.
MARVIN MICHAEL STARK 29 Garces Drive, San Francisco, California.	W. C. Fleming, Dean, University of California, Medical Center-College of Dentistry.
GORDON L. STASTNY 2522 Wesley Avenue, Berwyn, Illinois.	Allan G. Brodie, Dean, University of Illinois, College of Dentistry.
MORTON STEINBERG 57 Market Street, Passaic, New Jersey	G. D. Timmons, Dean, Temple University, School of Dentistry.
CAROL DON SWANBOM Lincoln, Nebraska.	B. L. Hooper, Dean, College of Dentistry, University of Nebraska.
WENDELL H. TAYLOR * 1024-3 North Court, Andalusia, Alabama.	J. F. Volker, Dean, University of Alabama, School of Dentistry.
LOUIS G. TERKLA 548 N.E. 43rd Avenue, Portland, Oregon.	Harold Noyes, Dean, University of Oregon, Dental School.
JOHN G. ULLMAN Benesford, South Dakota.	A. R. Baralt, Jr., Dean, Loyola Dental School, Chicago, Illinois.
ROBERT VAN BUREN 15 Prospect Street, Kingston, New York	Maurice J. Hickey, Dean, Columbia University, School of Dental and Oral Surgery.
ADRIAN JAMES VAN OSS 1609 Bolton Street, Baltimore, Maryland	J. Ben Robinson, Dean, Dental School, University of Maryland.
DEAN GUNN WINTERS Route No. 1, Helper, Utah.	Roy J. Rinehart, Dean, University of Kansas City, School of Dentistry.

The following names are those received too late for publication with the 1951 awards:

Nominee	*Recommending Officer and School*
DR. JOHN T. ANKENEY	R. W. McNulty, Dean, University of Southern California, College of Dentistry.
DR. DONALD KREBS	E. G. Sloman, Dean, College of Physicians & Surgeons, School of Dentistry.

* Nominee to receive the Journal only.

DENTAL SCHOOL IN CENTRAL AMERICA

Nominee	*Recommending Officer and School*
OSCAR ERNESTO ASENSIO Antigua, Guatemala.	Carlos Enrique Andreu, Dean, Facultad de Odontologia, Guatemala, Central America.

DENTAL SCHOOLS IN SOUTH AMERICA

Nominee	*Recommending Officer and School*
ALPIDIO JIMENEZ GOMEZ Calle 44#43A39, Medellin, Colombia.	Dr. Arturo Gonzalez Ch., University de Antioquia, Medellin, Colombia.
GUSTAVO CABRE FLORES Truco a Caja de Agua No. 17, Caracas, Venezuela.	L. Vizcarrondo, Dean, Escuela de Odontologia, Universidad Central.
JOSE RENE VIZCARRONDO Mureto a Pelaez No. 189, Caracas, Venezuela.	L. Vizcarrondo, Dean, Escultad de Odontologia, Universidad Central.
ERNESTO ROJAS F. Casilla 2053, Lima,Peru.	Luis J. Rojas Saenz, Dean, Facultad de Odontologia, Lima, Peru.

MEDICAL SCHOOLS

Nominee	*Recommending Officer and School*
GONZALO APONTE, JR. 1225 Spruce Street, Philadelphia, Pennsylvania.	George A. Bennett, Dean, Jefferson Medical College.
JOHN GAVIN APPLEBY 12 Mill Street, Charleston, South Carolina.	John Cuttins, Dean, Medical College of the State of South Carolina.
ROBERT BASIST 306 South Cleveland, Memphis, Tennessee.	F. L. Roberts, Assistant Dean, University of Tennessee, College of Medicine.
CHARLES MARKHAM BERRY 1147 Briarcliff Road, N.E., Atlanta, Georgia.	R. Hugh Wood, Dean, Emory University School of Medicine, Emory University.
SALLY BOGOLUB 950 E. 59th Street, Chicago, Illinois.	L. T. Coggleshall, Dean, Division of Biologicals, University of Chicago.
MARIO J. CAMPAGNA Philadelphia General Hospital, Philadelphia, Pennsylvania.	S. W. E. Baird, Dean, University of Oregon, Medical School.
JOSEPH CHANATRY Gallinger Memorial Hospital, Washington, D. C.	William R. Willard, Dean, State University of New York, at Syracuse, College of Medicine.
RALPH CLEARMAN 705—12th Street, Galveston, Texas.	D. Bailey Calvin, Dean, University of Texas, Medical Branch.
IRVIN M. CLEVELAND 235 N. 15th Street, Philadelphia 2, Pennsylvania.	H. A. Taggart, Assistant Dean, Hahnemann Medical College.
DR. LAWRENCE J. CONFORTO 422 Prospect Avenue, Buffalo, New York.	Stockton Kimball, Dean, University of Buffalo, School of Medicine.

Nominee	*Recommending Officer and School*
DR. ROBERT GRAHAM COOPER c/o Mr. W. B. Cooper, Germantown, Kentucky.	J. Murray Kinsman, Dean, University of Louisville, School of Medicine.
PHYLLIS CORBITT School of Medicine, Vanderbilt University, Nashville, Tennessee.	John B. Youmans, Dean, Vanderbilt University, School of Medicine.
EDWARD N. ERHLICH 17572 Stoepel Avenue, Detroit 21, Michigan.	A. C. Furstenberg, Dean, University of Michigan, Medical School.
STANLEY FELL 170 Prospect Park West, Brooklyn, New York.	Currier McEwen, Dean, New York University, College of Medicine.
GORDON R. FREEMAN U. S. Naval Hospital, San Diego, California.	Dr. A. R. Buchanan, Chairman, Honors Convocation Committee, University of Colorado, Medical Center.
SILAS JAY GINSBURG 336 South 42nd Street, Philadelphia 4, Pennsylvania.	William B. Kennedy, Vice Dean, University of Pennsylvania, School of Medicine.
EDWARD J. GLUCK 6 West 77th Street, New York, New York.	J. A. W. Betrick, Dean, New York Medical College, Flower and Fifth Ave. Hospitals.
WILLIAM EUGENE HARDEN Medical College of Georgia, Augusta, Georgia.	G. Lombard Kelly, President, Medical College of Georgia.
JOHN W. HEIN University of Rochester, School of Medicine and Dentistry, Rochester 20, New York.	G. H. Whipple, Dean, University of Rochester, School of Medicine and Dentistry.
WILLIAM FOUTS HOUSE 719 No. Citrus Avenue, Whittier, California.	B. O. Raulston, Dean, University of Southern California, School of Medicine and Dentistry.
RICHARD EDWIN HUNTON * 2405 Irving St. N.E., Washington, D. C.	W. A. Bloedorn, Dean, George Washington University, School of Medicine.
ERNEST WALTER JOHNSON 78 Chittenden Avenue, Columbus, Ohio.	Charles A. Doan, Dean, The Ohio State University, College of Medicine.
MARTIN D. KELLER Cornell University Medical College, New York 27, New York.	Dayton J. Edwards, Dean, Cornell University Medical College.
RAYMOND N. F. KILLEEN 3325 Parkview Avenue, Pittsburgh 13, Pennsylvania.	Richard D. Dorn, Assistant Dean, University of Pittsburgh, School of Medicine.
CLARENCE BRITIAN KIMBROUGH Meharry Medical College, Nashville, Tennessee.	Michael J. Bent, Dean, Meharry Medical College.
WESLEY KIME CME School of Medicine, 312 North Boyle Avenue, Los Angeles 33, California.	Varner J. Johns, Jr., Associate Dean, College of Medical Evangelists, School of Medicine.
EUGENE C. KLATTE * c/o University of Indiana, School of Medicine, Indianapolis, Indiana.	John J. Mahoney, Assistant Dean, University of Indiana, Medical Center.
DR. GEORGE KROLL 3553 Sunnyside Avenue, Chicago, Illinois.	Stanley W. Olson, Dean, University of Illinois, College of Medicine.

* Nominee to receive the Journal only.

Nominee	*Recommending Officer and School*
THOMAS KOURY 3213 North 17th Street, Philadelphia, Pennsylvania.	William N. Parkinson, Dean, Temple University, School of Medicine.
DR. ARNOLD KENNETH MAISLEN University of Yale, School of Medicine, New Haven, Connecticut.	Thomas R. Forbes, Assistant Dean, Yale University, School of Medicine.
GORDON MANSON 81 South Willard Street, Burlington, Vermont.	W. E. Brown, Dean, College of Medicine, University of Vermont.
WILLIAM ALLEN MATHEWS Box 234, Orangeville, Ohio.	H. Boyd Wylie, Dean, University of Maryland, School of Medicine.
JAMES O. MOERMOND 423—10th Street, Sheldon, Iowa.	W. M. Fowler, Dean, State University of Iowa, College of Medicine.
JOHN M. MOORE 1435 N. Everest, Oklahoma City, Oklahoma.	Homer F. Marsh, Dean, University of Oklahoma, School of Medicine.
DR. FLOYD F. NYRICK 2167 J. University Grove East, St. Paul, Minnesota.	Howard L. Horns, Dean, University of Minnesota, Medical School.
ROLAND NICKENS 149 W. Street, N.W., Washington 1, D. C.	Joseph L. Johnson, Dean, College of Medicine, Howard University.
A. Z. OSTROWSKI 1640 S. Grand Boulevard, St. Louis, Missouri.	Clement B. Grebel, Assistant Dean, St. Louis University, School of Medicine.
FREDRICH HASE RODENBAUGH 107 Southern Heights, San Francisco, California.	L. R. Chandler, Dean, Stanford University, School of Medicine.
J. J. LAWTON SMITH Duke Medical School, Durham, North Carolina.	Wilburt C. Davison, Dean, Duke Medical School.
CLETUS I. STEVENS St. Joseph's Hospital, Omaha, Nebraska.	Frederick G. Gillick, The Creighton University, School of Medicine.
DONALD T. STROY 111 South 42nd Street, Omaha, Nebraska.	Harold C. Lueth, Dean, University of Nebraska, School of Medicine.
MARTIN SULLIVAN 3359 New England, Chicago, Illinois.	John F. Sheehan, Dean, Stritch School of Medicine, Loyola University.
DOMINICK PRINCIPATO 1430 Tulane Avenue, New Orleans 12, Louisiana.	M. E. Lapham, Dean, Tulane University of Louisiana.
DR. CLARENCE WORKMAN * Abbott Hall, 710 Lake Shore Drive, Chicago 11, Illinois.	Richard H. Young, Dean, Northwestern University, Medical School.

MEDICAL SCHOOLS IN SOUTH AMERICA

Nominee	*Recommending Officer and School*
GUILLERMO RESTREPO CH. Apartado Nal. 409, Medellin, Colombia.	Igancio Valez Escobar, Decano, Facultad de Medicina, Medellin, Colombia.

* Nominee to receive the Journal only.

MEDICAL SCHOOLS IN CANADA

Nominee	*Recommending Officer and School*
JOSEPH JAMES HAZEL Fairview St. John, N. B.	H. G. Grant, Dean, Dalhousie University.
WILSON G. LEACH Faculty of Medicine, 346 South Street, London, Ontario.	G. E. Hobbs, Assistant Dean, University of W. Ontario, Faculty of Medicine.
PAUL RENE MADORE 2331 Blvd. Gouin, ouest, Montreal, Canada.	Wilbrod Bonin, Dean, University of Montreal, Faculty of Medicine.
R. W. SHERBANLUK Box 185, University of Alberta, Edmonton, Alberta.	John J. Ower, Dean, University of Alberta.

* Nominee to receive the Journal only.

Prevention of Dashboard Accidents*

Children sitting or standing in the front seat of automobiles are in the most dangerous position in cars and frequently their teeth are fractured by hitting the dashboard at sudden stops.

Dr. Henry Marsh Wilbur, associate professor of children's dentistry at the University of Louisville School of Dentistry, made that statement recently in The Journal of the American Dental Association.

He added that front seat passengers in autos suffer injuries, especially to their mouths and teeth, three times more frequently than drivers.

Dr. Wilbur cited recommendations of experts that crash pads be installed on dashboards to protect children and other front seat passengers from violent impact with knobs and protuberances.

"It is important that parents be informed of the necessity for professional attention as soon as an accident involving the teeth occurs," he said.

Splints may be applied to a block of teeth which have been fractured or a single tooth which has been loosened, and other treatment may be given as the case demands, Dr. Wilbur declared.

* J.A.D.A. News Release Jan. 1, 1952.

BOOK REVIEWS

Surgical Pathology of the Mouth. By E. Wilford Fish, C.B.E., M.D., ChB., L.D.S. (Manchester), D.D.Sc. (Melb.), Laboratory for Dental Research, St. Mary's Hospital, London. Philadelphia, J. B. Lippencott Co., 1951. $10.

This text intended to present pathologic oral conditions amenable to surgical correction does not fulfill the promise of the title. The book, however, is well organized and written presenting numerous experimental microscopic studies. This material is enhanced by the many microphotographs presented by the author.

This is good material as background for practitioners and students who wish to do advanced work in oral pathology as it relates to the teeth and their supporting structures. There is a lack of material and photographs of soft tissue and bone pathology which lend themselves to repair by surgery.

The subjects covered in the book are well done but are concerned for the most part with the teeth. The summary at the end of each chapter is a practical idea lending for rapid review.

The physical aspect of the book is good, the solid type on glossy paper making for easy reading. The reproductions of photographs are well done.

This book is a worth while addition to the library of those who wish to prepare for further study in oral pathology.

L.R.B.

The Porcelain Jacket Crown. By S. Charles Brecker, D.D.S., St. Louis. C. V. Mosby Co., 1951. 263 pp. 290 ills. $8.00.

This clearly printed and well illustrated manual answers a problem which is becoming increasingly more important in everyday dental practice. Heretofore, most general textbooks have inadequately referred to the porcelain jacket crown. Clinicians have almost always described the jacket crown by means of typodonts or models. Dr. Becker presents to the dentist a "chairside guide" to the management of the porcelain jacket crown as it is influenced by its position in the dental arch. This book takes into account the treatment of such problems as the mal-turned tooth, the overlapped tooth, the protruding tooth, the tooth in lingual relation, correction of abnormal spaces, teeth in open and closed bites, etc.

The author presents a simple, direct and logical approach illustrated step-by-step with actual clinical photographs of the chair position, finger position, proper tissue retraction, accompanied by schematic drawings of the instrument in relation to the tooth. The complete management of the tooth in each of the problems which confront the practitioner is shown; as for example he has taken into account the fact that the treatment of the upper right molar is entirely different from the approach to the lower left premolar.

In Chapter 3, the author succinctly shows and describes the treatment for some of the special problems that confront the general practitioner such as the spear-shaped canine, tapering laterals, thin, delicate incisors with the translucent incisal edges, lower triangular shaped incisor, a short broad upper incisor, and many others.

In Chapter 4 there are the same lucid instructions for the treatment of teeth which require special treatment due to their condition in the arch, such as non-vital teeth, teeth with old Davis or Richmond crowns too impractical to remove, and many others.

Chapter 5 describes the treatment of the abnormal, such as overlapped teeth, lingually locked tooth, protruding and abnormally spaced teeth.

Chapter 6 is devoted to procedures for making an impression of the prepared tooth; the method of taking a shade; the post-operative care and the final cementation of the jacket crown.

Chapter 7 brings to the practitioner the author's experienced analysis of the "shortcomings" of the porcelain jacket crown; how to prevent or minimize them. Here he describes the cause and treatment of gingival irritations such as the red, inflamed gingiva, copings, splinting of lower anterior teeth. Included in the chapter is a brief description of electronic surgery which can be used as an aid in the prevention of gingival irritation. The author presents his analysis of the reasons why porcelain jackets fracture or become dislodged. He lists and illustrates these conditions.

The book is concluded with Chapter 8, titled "Porcelain Bridges." The use of the porcelain jacket crown as an abutment in several types of bridgework is described.

The author lists as an added source of information for the reader 38 references. Also, there is a detailed index.

Dr. Brecker has presented the dentist with a manual which describes step-by-step, and clinically illustrates with actual "chairside photographs" and schematic drawings, the complete management of the porcelain jacket crown. A study of this book will reduce the working time of the operator and simplify the problems that are associated with the treatment of the porcelain jacket crown. This is a must for every general practitioner.

M. J. S.

Dental Formulas. By Louis I. Grossman, D.D.S., Philadelphia, Lea & Febiger, 1952. 318 pp., 25 illustrations, $5.00.

This book deals not only with the basic therapeutic handling of each aspect of dental science and practice but is crowded full of formulas and information required by anyone associated with dentistry. It discloses, in addition, the formulas of many proprietary preparations whose uses can thus be more intelligently understood and applied by dentists who are expected to apply or perscribe them.

Specific drugs, formulae and preparations, together with an evaluation of their effectiveness are given for every possible treatment and contingency in dentistry. This includes preparations for use in operative dentistry, ceramics, prosthetics (with formulas for impression materials and dental waxes), anesthesia, exodontia, periodontia, oral hygiene, surgery, nutrition (with a list of signs and symptoms of deficiency states), x-ray processing, bacteriology, histology, and cosmetics (such as hand lotions and soaps).

This book will satisfy the bump of inventiveness possessed by most dentists by furnishing the basic formulae for cements, plasters, gold alloys, solders, porcelains and investment materials and many others that enter into the science and art of dentistry. Helpful tables of general information include the antimicrobial activity of antibiotics, Tainter on medication for postoperative pain, weights, measures and their equivalents, abbreviations for prescription writing and an adaptation from "Accepted Dental Remedies of Poisons and their Antidotes."

This handbook of Dental Formulas is more commendable for the use of the dentist, laboratory worker and pharmacist than any previous compendia and should be of daily use to the interested and alert pharmacist and dentist.

J. L. B.

Juvenile Dentistry. By Walter C. McBride, D.D.S., F.A.C.D., Philadelphia, Pa., Lea & Febiger, 1952. 5th Edition. 370 pp. 302 ills. $7.00.

Improved methods and technics are attracting more and more dentists to the ever broadening field of juvenile dentistry. This book stresses these features and shows the dentist how he can apply them successfully and thus form a logical foundation for building a permanent and profitable practice. Emphasis is on the management of children, on the elimination of devitalized and abscessed teeth and lost fillings, and on those remedial measures which are such an important contribution to preventive dentistry which some believe will ultimately supplant corrective dentistry.

For this *fifth edition,* Dr. McBride has brought his work fully up to date. He has included, along with numerous other changes and additions, three major departures: The root canal therapy used at the University of Detroit School of Dentistry; chronology of the two dentitions as outlined by Drs. Schour and Massler; and a new chapter on Teeth and the Diet, by Dr. Dorothea F. Radusch. Also new for this edition is a consideration of the dental needs and methods of treatment of children suffering from cerebral palsy.

The procedures and technics outlined in this practical text have been fully tested and have proved successful in the author's extensive practice. It was written to help dentists meet successfully the increasing demand for children's dental service by parents educated to the need through articles in the public press and by effective school health programs. Dentists who recognize and want to meet the new responsibilities thus created will find full guidance in this fifth edition of *Juvenile Dentistry.*

THE JOURNAL WELCOMES INDONESIAN SUBSCRIBERS

Recently a group subscription for thirteen Indonesian dentists was received. It is gratifying to the Academy to know that its activities have been noted in distant lands.

The officers and staff of the Journal welcome these subscribers and hope that in the near future they may perhaps become active participants in the work we foster.

Should any of our members wish to contact these dentists for exchange of periodicals or other information, they may be addressed as follows:

Pusat Perpustaken Anghatan Darat
Djalan Beltuing 6
Bandung, Indonesia

MEDICAL VIEWS ON ORAL PROBLEMS

AUREOMYCIN TREATMENT OF RECURRENT ORAL APHTHAE*

Gottlieb discusses rational treatment of oral aphthae on the assumption that they are due to activation of a latent virus infection. He reports 14 cases of long standing with free intervals of a month at the most, refractory to earlier treatment, in which aureomycin was given locally, mainly as a mouth wash. The result was good in 8 of the 11 cases of Mikulicz's solitary recurrent aphthae, and in Sutton's aphthae improvement occurred in two cases and one patient did not respond to the treatment. In two cases of multiple recurrent aphthae the treatment had no effect.

* J.A.M.A. March 22, 1952.

WARTS OF THE TONGUE*

To the Editor: I would like to know how much formaldehyde I could use in honey for venereal warts of the tongue and mouth as a swab. I have tried aureomycin and penicillin with no results.

ALBERT C. LUNDGREN, M.D,. Minneapolis.

ANSWER.—Formaldehyde is used usually in concentrations of 3% to 10% and should be used with great caution on an area such as the tongue. Lynch and Karon, who recently reported on a large experience with the use of formaldehyde ointment for warts (*Arch. Dermat. & Syph.* 62:803 [Dec.] 1950) stated that it should not be used for condylomas; they prefer podophyllum resin instead.

* J.A.M.A. Dec. 1, 1951.

FLUORIDATION OF WATER SUPPLIES*

The Council on Pharmacy and Chemistry and the Council on Foods and Nutrition have been requested to state their opinion regarding the safety of fluoridation of water supplies, a procedure which has now been adopted by more than 140 cities.

The Councils are unaware of any evidence that fluoridation of community water supplies up to a concentration of one part per million would lead to structural changes in the bones or to an increase in the incidence of fractures. The only difficulty so far revealed is a possible increase in mottling of the tooth enamel. The available evidence based on thousands of observations indicates that the incidence of mottling of the enamel in children who drink water containing fluoride up to a concentration of one part in a million is minimal and detectable only by careful dental examination. It occurs only in a small percentage of children and is so slight as not to present a problem from the point of view of appearance or strength of the teeth. Evidence of toxicity other than the effect on enamel has not been reported in communities where the water supply has several times this concentration. After considering the evidence available at this time, the Councils believe that the use of drinking water containing up to one part per million of fluoride is safe. However, the use of products which are naturally high in fluoride content, such as bone meal tablets, or of lozenges, dentifrices, or chewing gum, to which fluoride has been added, should be avoided where the drinking water has been fluoridated. In places where children are subjected to warm temperatures and consequently drink large amounts of water, a lower concentration of fluoride may be necessary to avoid mottling of the teeth.

* J.A.M.A. Dec. 1, 1951.

DERMATITIS DUE TO CINNAMON*

In the case reported in this paper, a chronic vesicular dermatitis of the hands of five years' duration was found to be due to tooth paste flavored with cinnamon oil. The hand eruption had occurred first and had apparently been induced by repeated contact with cinnamon powder. Patch tests with cinnamon oil, 1% in alcohol, gave a 4+ reaction. Cure of the entire eruption followed cessation of contact with cinnamon. The lips and buccal mucous membrane had not been sensitized. Apparently, when the skin is the original surface sensitized, the mucous membranes are seldom sensitized on a clinical level. Contrariwise, when the mucous membrane is the original surface sensitized, the skin almost always shares in the sensitization. Ingestion of cinnamon powder was followed by itching of the hands in 12 hours. Ingestion of cinnamon oil was followed by itching and vesiculation of the hands after five days (delayed reaction) on one occasion and after 12 hours on a second occasion.

* Abstract from J.A.M.A., Sept. 15, 1951. p. 276.

CRACKS AT CORNERS OF MOUTH*

To the Editor: Can well-fitting dentures cause cracks at the corners of the mouth? My patient has had this irritating affliction for eight years; it started shortly after he was fitted for upper dentures. He tells me that last year he spent $260 for vitamins alone and "has been shot with everything but a .38 pistol." I would appreciate information on this matter.

LAURIER E. HACKETT, M.D., Camilla, Ga.

ANSWER. — Well-fitting dentures will not produce cracks at the corners of the mouth. An inadequate diet will. The question is not how many vitamins the patient has taken but, more probably, how much food. Darby has reported the cure of carefully controlled cases of superficial glossitis with iron. Has the patient's lack of natural teeth prevented his eating meat and other important foods? It is suggested that your patient be given iron and a liberal diet, including an abundance of fruits, vegetables, and meat. The dentures are not directly at fault.

* J.A.M.A., Dec. 8, 1951.

SPEECH DEFECT FOLLOWING CEREBRAL ACCIDENT*

To the Editor: My father, who is 64, has essential hypertension (240/180). He had a stroke. I have treated him with all the known methods, and, although the blood pressure now is 160/110, the neurological and cerebral phenomena have not been overcome. His only annoyance is a type of local paralysis which prevents his pronouncing clearly words containing the letters "p" and "r." He is also diabetic; I have tried to overcome this condition without success. I am now using neostigmine bromide but without effect. Is there anything new that could help my father recover full power of speech?

DIXON RAMIREZ, M.D.,
Cabo Rojo, Puerto Rico.

ANSWER.—It would seem likely that the improvement in the neurological deficit here is all that could be expected. There is no form of medical treatment available at present that is likely to bring about further improvement in a case of cerebral thrombosis with a partial aphasia such as is described here. Naturally, with the passage of time and reeducation of the speech centers, further improvement in the speech defect may occur.

* J.A.M.A., Dec. 8, 1951.

LEONTIASIS OSSEA*

To the Editor: A 15 year old girl shows an asymmetrical bulging of the left frontotemporal region extending downward over the cheek. This appeared around the age of 3. At 2 years of age she fell and apparently sustained a fracture of the skull at the left frontal area. There has been a gradual increase in the prominence of the bones. There are no subjective symptoms except for headaches that are mild and apparently associated with eye strain. X-rays of the skull reveal considerable hyperostosis and enlargement of the affected bones with the sphenoidal and frontal sinuses obliterated. The x-ray diagnosis is leontiasis ossea (fibrous dysplasia). Is there anything that can be done to prevent the continuance of the process?

ALBERT IRVING CLARK, M.D.,
Shreveport, La.

ANSWER.—A discussion of this condition can be found in a recent article by Feiring, Feiring, and Davidoff in the July, 1951, issue of the *Journal of Neurosurgery*. These lesions may sometimes be removed surgically, and cranioplasty with a tantalum plate can be done to improve the cosmetic appearance when indicated. When the lesion involves the base of the skull around the optic nerves and sella, surgical removal may be attempted in an effort to relieve pressure on optic nerves or vital structures in this area. These lesions are for the most part resistant to x-ray therapy.

* J.A.M.A., Dec. 8, 1951.

ENLARGED TONGUE IN INFANT*

To the Editor: A newborn child, who had a full term and spontaneous delivery, has a symmetrically enlarged tongue, most of which protrudes from the mouth. Motility is normal, and little interference with feeding is noted. Competent pediatricians find no other physical abnormality. What are the diagnostic possibilities, prognosis, and treatment?

M.D., Illinois.

ANSWER.—Enlarged tongue, or macroglossia, is a noninflammatory enlargement. In most instances, this abnormality represents simple enlargement; certain severe cases are caused by an anomaly of the lymphatics comparable to lymphanigioma. The tongue may reach enormous size, interfering with nursing, deglutition, and even with respiration. A certain amount of improvement may take place spontaneously, but in severe cases operation is required. Such cases are to be distinguished from those of enlargement of the tongue seen in cretinism. In this disease the tongue is considerably enlarged and may protrude slightly from the mouth, but it is rarely, if ever, large enough to cause other symptoms. The diagnosis of cretinism may be substantiated by determination of blood cholesterol, which is increased in this condition, and by roentgenologic assessment of skeletal development. Retarded bone age is characteristic of cretinism. The absence of the inferior epiphysis of the femur occurs in the newborn cretin, in contrast to the normal newborn, in whom the inferior epiphysis is present. This may be evidence of retarded osseous development occurring in utero in congenital cretinism.

Thyroid may be administered orally or parenterally to cause shrinkage of the tongue when the diagnosis of cretinism has been established. Macroglossia also occurs congenitally in idiocy and mongolism in the form of an increase in the interstitial tissue. In these diseases, the tongue, while showing no evi-

dence of tumor formation, is too large for the mouth, protrudes beyond the lips, and is likely to be somewhat flabby.

* J.A.M.A., April 5, 1952.

LINGUAL SCRAPINGS DURING ANTIBIOTIC TREATMENT*

Previous investigation of side-effects of chloramphenicol and aureomycin have shown that changes were more frequent in the oral cavity than in other parts of the body; they consist of dryness of the mouth, throat manifestations, angular stomatitis, and changes in the oral mucous membranes. Striking changes were seen in the dorsum of the tongue; the commonest was the disappearance of the normal whitish coating with atrophy in the filiform papillae, and, in extreme cases, atrophic glossitis with redness and soreness of the tongue. The present paper describes microscopic examinations of lingual scrapings that were made before, during, and after treatment with chloramphenicol and aureomycin in 126 patients. In the majority of patients these antibiotics caused the disappearance of the normal bacterial flora and in the remainder the bacteria were diminished. In many patients yeast-like fungi (usualy Candida albicans) replaced the bacterial flora. The fungi are profuse in hypertrophic glossitis, and scanty in the atrophic type. It is suspected that an antagonism exists in the oral cavity between bacterial flora and fungi. The increased number of leukocytes, which is particularly noticeable in atrophic glossitis, is probably a sign of inflammatory reaction to the fungal infection. Many patients whose tongue had a normal appearance and in whom the bacterial flora was still present had received vitamin B complex simultaneously with the antibiotics. In a few cases, however, acute oral lesions, resembling those of vitamin B deficiency, developed in spite of vitamin treatment. The striking similarity of the oral changes associated with antibiotic therapy to those of vitamin B deficiency has caused some authors to believe that these lesions are signs of vitamin B deficiency, but some factors make this doubtful. Recently it has been sugested that aureomycin and chloramphenicol might exert a blocking action on the intracellular metabolism and thus produce changes resembling those due to vitamin deficiency. At any rate there is evidence that normal bacterial flora is necessary for the healthy structure and function of the mucous membranes.

* Abstract from J.A.M.A., April 5, 1952. p. 1253.

DENTAL DISEASE AMONG 14-YEAR-OLD CHILDREN*

Two surveys of 14-year-old London school children are reported. The inspections were made with a probe and mirror. The proportion of children found to be free from caries, according to the standards used, was 11.5% in 1947 and 16.1 in 1950%. A total of 14.6% of the teeth in 1947 were carious, whereas for 1950 the figure was 13.9%. Only small differences were found between the two surveys as regards the amount of caries in the different types of teeth. The amount of treatment (fillings and extractions) that the teeth had received is briefly considered. An over-all reduction of 5% was noted in 1950 as compared with 1947. Some degree of gingivitis was found to occur in 73.7% of the children examined in 1947 and in 95.1% of those seen in 1950. Tartar deposits were frequently found, and there appeared to be some relation between the amount of tartar and the incidence and extent of gingivitis.

* Abstract from J.A.M.A., April 19, 1952. p. 1450.

BITTER TASTE FOLLOWING GASTRECTOMY*

To the Editor: A man 65 underwent a subtotal gastrectomy for recurrent bleeding of a duodenal ulcer. Since the operation he has complained of a constant bitter taste in the mouth that disturbs him greatly. The only therapy that ameliorates this symptom somewhat is the use of chewing gum or candy drops. He is not anemic, does not vomit or have diarrhea. What do you advise?

M.D., Pennsylvania.

ANSWER.—The symptom of bitter taste in mouth caused by subtotal gastrectomy must be rare, since such authorities as Bockus, Portis, and Eusterman do not even mention it as a sequel of the operation in their texts. In addition, the literature fails to reveal any consistent association of this symptom with subtotal gastrectomy. Therefore, other causes must be considered. These may be (1) possible biliary regurgitation, owing to the dilated afferent loop opening into the stomach and regurgitating into the esophagus; (2) galvanism, which may be a factor where the patient has two different kinds of metal filling the teeth; (3) gingival abnormalities; (4) exposure to metallic materials; and (5) cerebral arteriosclerosis.

The last condition is probably the most frequent and, unfortunately, does not resond to therapy. Such empirical measures as nicotinic acid, papaverine, and aminophylline may be tried. Occasionally, patients who have undergone subtotal gastrectomy respond to dilute hydrochloric acid given one half hour and one hour after meals.

It is difficult to explain the relief obtained by the chewing of gum and sucking of candy drops. However, there is no specific contraindication for their use, except that patients who have had a peptic ulcer and have intact vagi should not have free sugar in their diet for a long time. It may be that if free sugar is omitted there will be some improvement in the patient's clinical picture.

* J.A.M.A., June 5, 1952.

ANNOUNCEMENTS

American Academy of Dental Medicine Announces Mid-Winter Meeting

The American Academy of Dental Medicine will hold its annual Mid-Winter Meeting and Luncheon at the Hotel Statler in New York City on Sunday, December 7, 1952. There will be a Business Meeting for members at 10 A.M.

A symposium on "Pain" will be presented following the Luncheon. The symposium will be discussed by Drs. R. J. Behan, Theodore Blum, Samuel C. Miller, with Dr. Joseph L. Bernier acting as Moderator. All members and interested dentists and physicians are cordially invited. For further information contact the Committee.

Jack Englander,
2616 Hudson Blvd., Jersey City, N. J.
Samuel Turkenkopf,
196 Montclair Ave., Newark, N. J.
Co-Chairman

Postgraduate Training in Periodontia and Oral Medicine New York University College of Dentistry

The Periodontia Department of New York University College of Dentistry which has been giving postgraduate courses in this subject since 1926, announces that several different courses in Periodontia and Oral Medicine are available during the academic year, 1952-1953. The courses vary from full time participation to short courses for the busy practitioner. All courses are under the direct supervision of Professor Samuel Charles Miller.

PERIODONTIA 122A (continuous, daily, one year)

This one year course consists of lectures, motion pictures, models, demonstrations with clinical practice in all phases of periodontal diagnosis and treatment, including conservative and radical techniques and equilibration of occlusion. Successful completion of this course leads to a certificate. One academic year, daily, Monday through Friday, 9 a.m. to 4 p.m. September 15, 1952 to May 23, 1953. Limited to 4. Tuition $1,000. Books $29.50. Instruments approximately $100.00. Rental fee $1.00.

PERIODONTIA 122B (half time, two years)

This two year course has the same content as the one year course, full time. Two academic years, two and one half days weekly, September 22, 1952 to May 23, 1954. Limited to 4. Tuition for two years $1,000. Books $29.50. Instruments approximaely $100.00. Rental fee $2.00.

PERIODONTIA 123A (intermittent, evening-afternoon)

This 20 hour course consists of a study of the following: etiology; pathology; diagnosis, prognosis of periodontal disease; equilibration of occlusion; gingival massage, instrumentation, conservative and radical treatment; acute necrotizing ulcerative gingivitis (Vincent's infection); drugs; diet; maintenance of mouth health; prevention, etc. Ten weekly, two hour sessions, Wednesdays, 7 to 9 p.m. (for first four sessions—lectures) and 4 to 6 p.m. (for last six sessions —clinical demonstration) October 8 to December 10, 1952. Tuition $130.00. Books $21.50. Instruments approximately $65.00. Rental fee $1.00.

PERIODONTIA 123B (intermittent, evening-afternoon)

Course 123A repeated. February 25 to May 6, 1953.

PERIODONTIA 123C (one week, morning-afternoon)

Review course, one week, June 1 to June 5, 1953. Monday through Friday, 9 a.m. to 4 p.m. Limited to previous periodontia postgraduate students. Tuition $130.00. No instruments required.

PERIODONTIA 124 (continuous, morning-afternoon)

This 90 hours course consists of a study of the following: etiology; pathology; diagnosis; prognosis of periodontal disease; equilibration of occlusion; gingival massage, instrumentation, conservative and radical treatment; acute necrotizing ulcerative gingivitis (Vincent's infection); drugs; diet; maintenance of mouth health, prevention, etc. Fifteen, six hour sessions, daily, Monday through Friday, 9 a.m. to 4 p.m., June 1 to June 19, 1953. Tuition $300.00. Books $21.50. Instruments approximately $65.00 Rental fee $1.00.

Special Participation Course in Occluso-Rehabilitation at Tufts

This course will consist of lectures, clinical demonstrations, and practice in the science and art of occluso-rehabilitation. The entire course will be under the supervision of Dr. Louis Alexander Cohn who will present the details of reconstruction technics whereby the basic principles of occluso-rehabilitation are applied to clinical practice. The inter-relationship of occluso-rehabilitation and periodontal treatment will be stressed. Each participant will carry a case through to completion. It will be permissable for the participant to bring a patient of his own.

This course will be given every other week on Friday and Saturday from 9 a.m. to 5 p.m. for seven months from October, 1952 to April, 1953. Enrollment is limited to 12. Further information and application forms may be obtained by writing the Director of Postgraduate Studies, Tufts College Dental School, 136 Harrison Ave.

The American Academy of Implant Dentures Organized

The American Academy of Implant Dentures was formed at the Chicago Mid-Winter Dental Meeting. Its purpose is the ethical promulgation of "Implant Dentures"; through a cooperative effort established, by means of a mutual exchange of research advancements and attainmens, in this phase of dentistry.

Especial note was made, that the field contains three major participants; prosthetic, surgical and technical.

The qualifications necessary for participation in this academy are as follows: Membership in good standing of the American Dental Association or a component society thereof, or if beyond the territorial limits of the United States, the applicant must be a member in good standing of a recognized dental society. Secondly, the applicant for membership must have made successful advancements in this field.

For further information write: The American Academy of Implant Dentures, Office of the Secretary, Rochester, Minnesota."